

# TECHNOLOGY

REVIEW *December* 1951

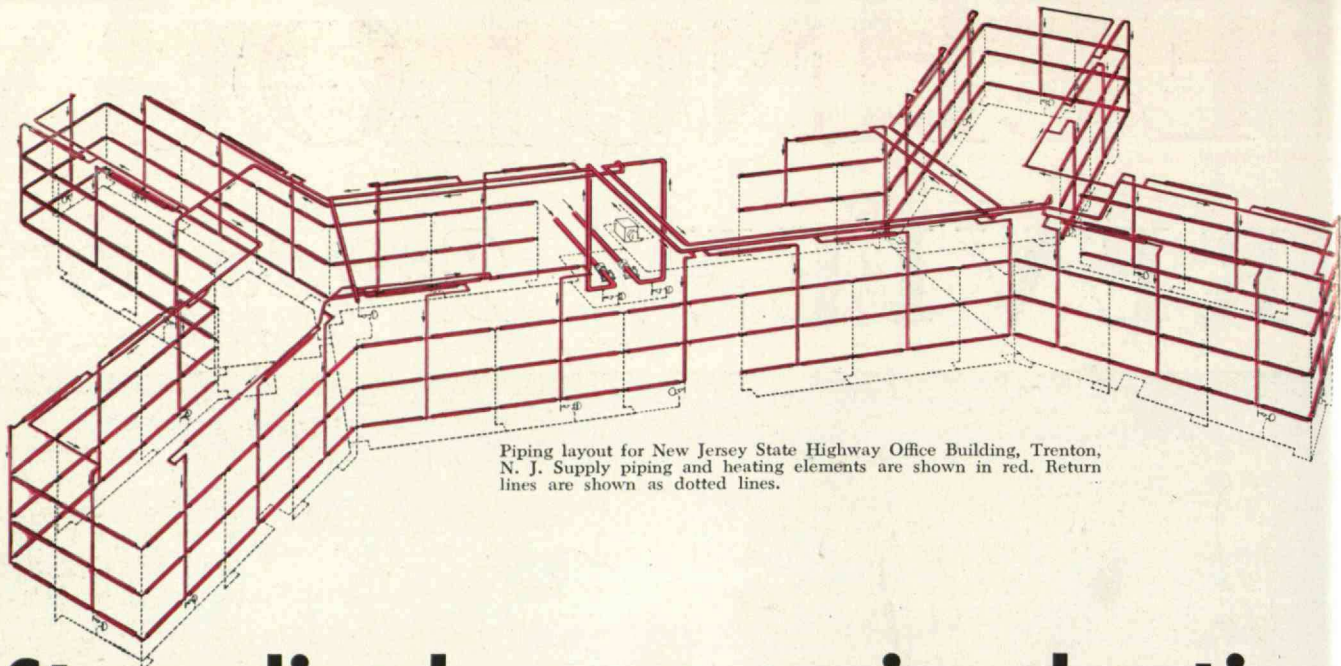


# technology review

Published by MIT

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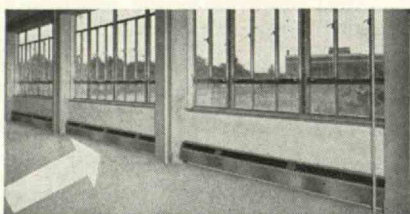


Piping layout for New Jersey State Highway Office Building, Trenton, N. J. Supply piping and heating elements are shown in red. Return lines are shown as dotted lines.

## Streamlined space-saving heating



Aerial view of New Jersey State Highway Office Building, Micklewright & Mountford, Trenton, Architects. Runyon and Carey, Newark, Consulting engineers. Philip S. Slack & Co., Trenton, Heating Contractors.



Webster Walvector spreads the heat . . . no cold spots. Note supply and return risers; location of Walvector trim piece connections below window mullions facilitating installation of office partitions.

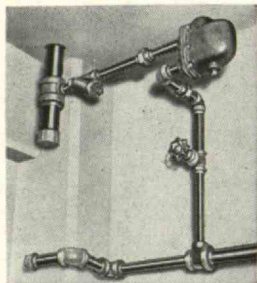
The new \$1,700,000 headquarters and office building for the New Jersey State Highway Department, sponsored by Governor Alfred E. Driscoll, is marked by three innovations: (1) for economy, streamlined modern design in place of usual monumental architecture; (2) for efficiency and parking ease, location outside of city; (3) streamlined, space-saving heating with Webster Walvectors. The alert cooperation of contractor Philip S. Slack in working out details of the new developments with the architects and engineers, contributed much to the success of the installation.

A Webster Moderator System provides "Controlled-by-the-Weather" heating for this modern building with Webster Walvectors equipped with integral tube orifices to spread the heat along exposed walls. Webster Convectors are used in stairways and Webster-Nesbitt Unit Heaters provide supplemental heating in corridors.

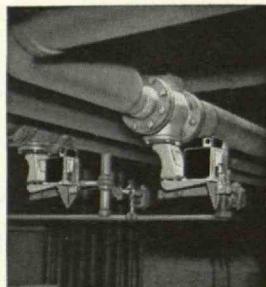
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TR-12

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Typical Drip Connection.

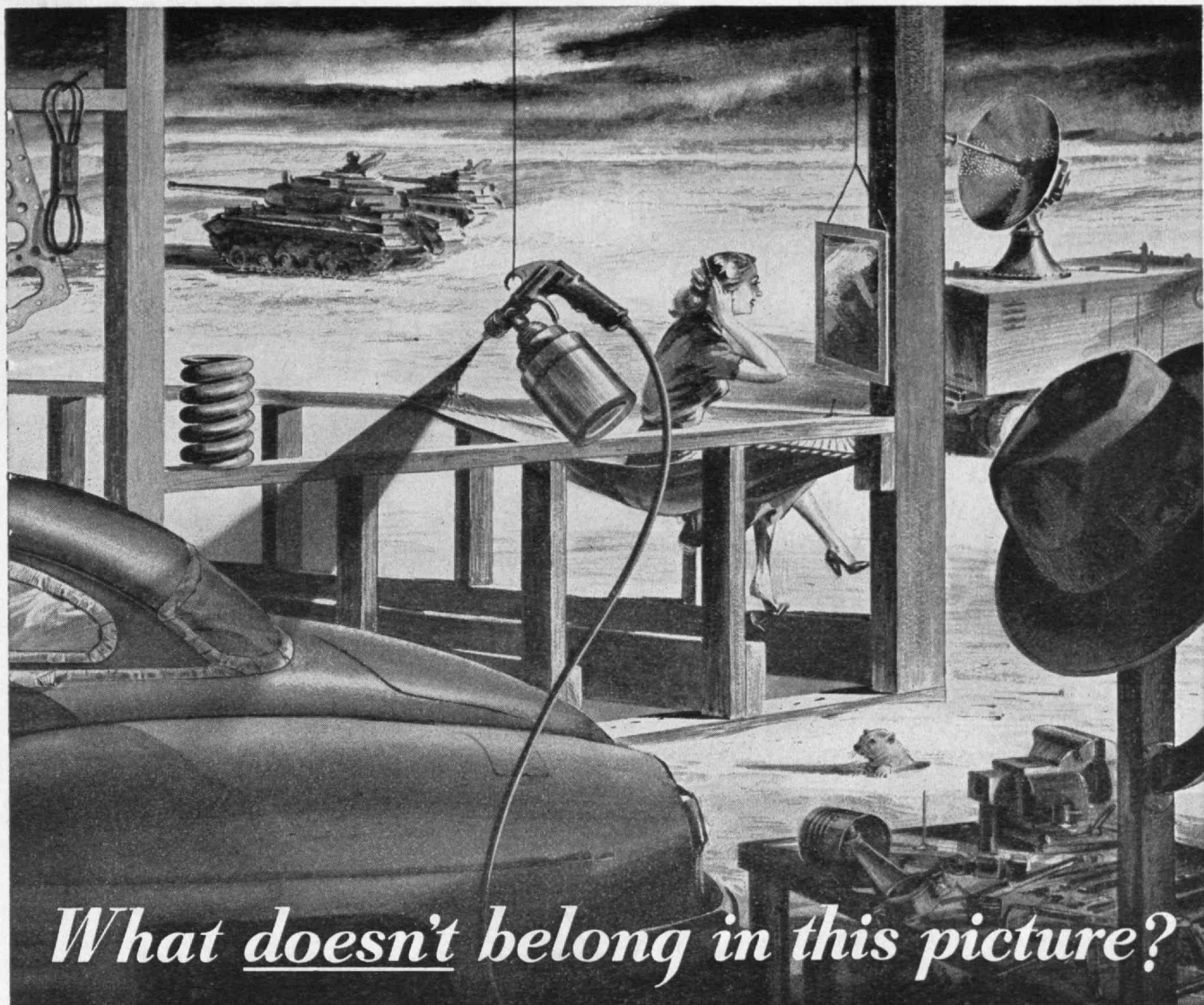


Moderator Control Valve.

**WEBSTER**  
**MODERATOR**  
**SYSTEM**  
**OF STEAM HEATING**

**"Controlled by the weather"**





## *What doesn't belong in this picture?*

All but one of the objects in this picture have something in common. They were affected directly or indirectly by the kind of products Norton and Behr-Manning make. *Can you find the stranger?*

**The Car?** No! Automobile production depends directly on Norton and Behr-Manning abrasive products. In fact, their use is essential in automobile maintenance as well as in production. A new Behr-Manning product, Behr-cat Masking Tape, performs an indispensable service on repaint jobs.

**The Woman?** No! She, too, depends on Norton or Behr-Manning abrasive products to help produce her shoes, dress, cosmetics, jewelry — everything she wears or uses.

**The Felt Hat?** No! Most felt hats get a rub-down

from Pouncing Paper, a Behr-Manning coated abrasive.

**Neither Is It** the Army tank, the radar unit, the wooden building, nor the metal spring.

**The stranger in the picture** is the gopher . . . who does not rely on man-made products. Remember, any man-made product . . . whether of metal, wood, paper, cloth, leather, ceramics, or plastics . . . depends on abrasives, abrasive products, refractories, or grinding machines that bear such well-known trade-marks as Norton and Behr-Manning . . . world's largest manufacturers of abrasives and abrasive products.



*Making better products to make other products better*



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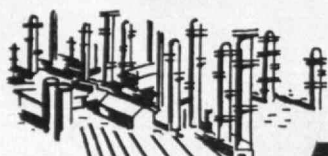
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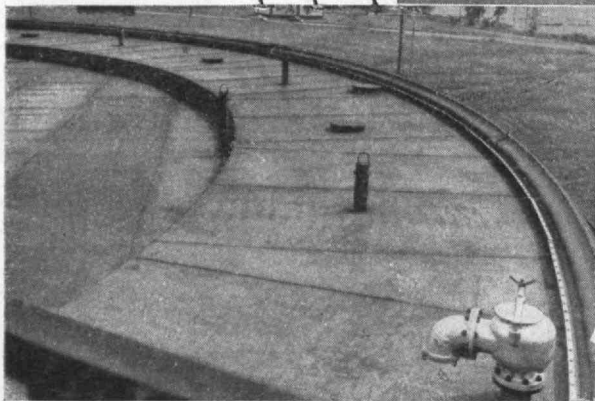
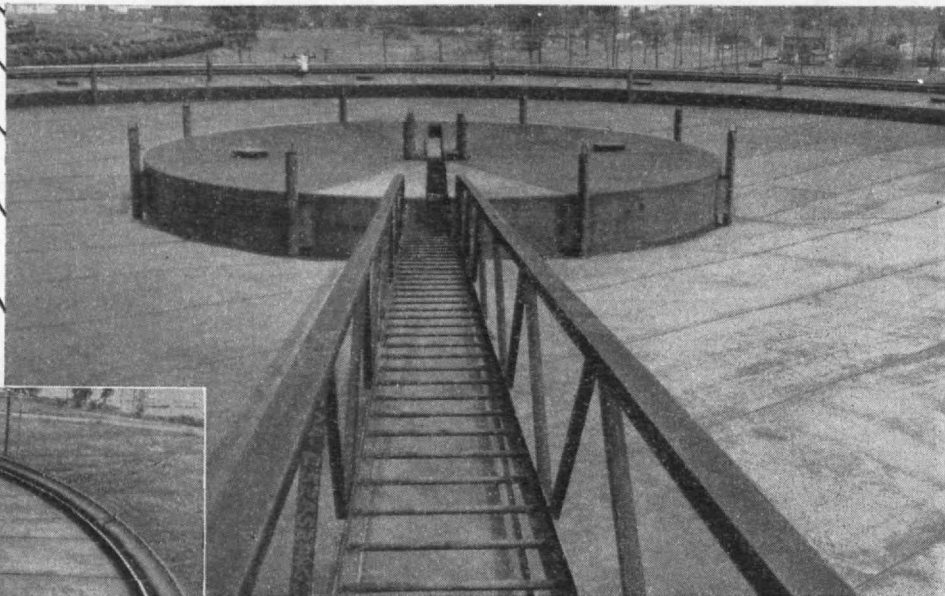
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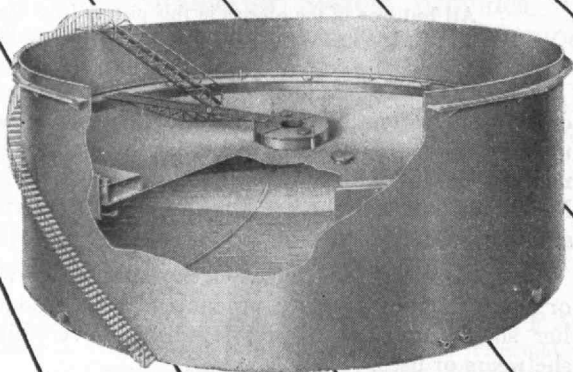
## **GRAVER** CENTER-WEIGHTED FLOATING ROOF TANK

### A PROVED DESIGN FOR 3-WAY ECONOMY

- No Corrosion — No Filling Losses
- Takes Less Steel To Build
- Lower Maintenance Cost

Built for the storage of crudes or finished petroleum products, the patented design of the Graver Center-Weighted Floating Roof combines the stability, the vapor-savings and the corrosion resistance of the Double Deck Floating Roof with the more economical aspects of the conventional pan-type roof.

Announced in November, 1950, after several years on the drawing board and a full year of exhaustive tests . . . this new design already has been widely accepted by the petroleum industry. New tanks with Graver's single deck floating roofs have been completed in six states with similar installations scheduled for nine more, covering all sections of the nation. Capacities of the tanks built and on order range from 20,000 to 150,000 bbls.; diameters from 60' to 150'.



## **GRAVER TANK & MFG. CO., INC.**

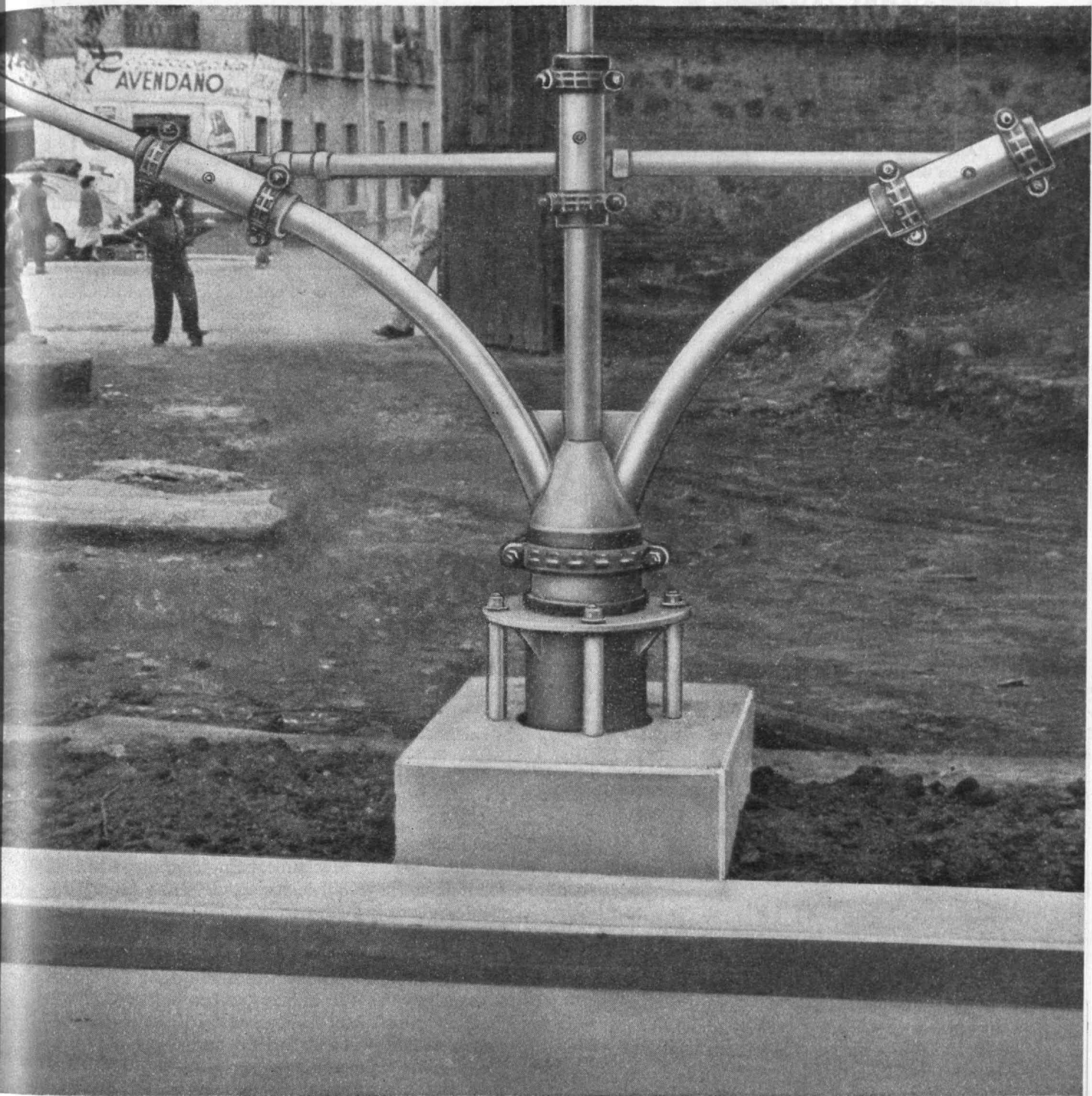
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## THE TABULAR VIEW

**Motivation.** — The incentives which bring to the surface the best of human efforts are examined (page 80) by CRAWFORD H. GREENEWALT, '22, who concludes that monetary rewards are the most impelling, and that lack of suitable incentives for personal achievement retards progress. In "What Kind of Incentives?" (adapted for The Review from an address given before the Illinois State Chamber of Commerce on October 19), Dr. Greenewalt then goes on to examine the effects of wealth distribution and high income taxes on the management of the nation's industries. As president of E. I. du Pont de Nemours and Company, Inc. since 1948, Dr. Greenewalt speaks authoritatively on industrial problems. He received his bachelor's degree in Chemical Engineering from M.I.T. in 1922, and the honorary degree of doctor of science from the University of Delaware in 1940. Since 1922 he has held important research and administrative positions in the Du Pont organization.

**Medication.** — While international diplomats are engaged in saving face for our enemies in Korea, members of the Army's Medical Corps are busy saving the lives of United Nations soldiers. The success of the medical program in Korea is outlined (page 83) by JAMES A. TOBEY, '15, who reports that the figures of 80 fatalities per 1,000 casualties in World War I, and 45 in World War II have been reduced to 25 per 1,000 during the Korean "police action." From M.I.T. Dr. Tobey received the S.B. and Dr.P.H. degrees in 1916 and 1927, respectively. Colonel Tobey is now serving on active duty with the Army Medical Service.

**Education.** — For more than a century, adult education in New England has been profoundly influenced by the remarkable will and benefactions of the farsighted John Lowell, Jr. Educational activities both at Harvard and at M.I.T. have been influenced by the Lowell lectures, as ARTHUR L. TOWNSEND, '13, Associate Professor of Mechanical Engineering at M.I.T., reminds us (page 85) in his article, "The Lowell Institute School," which was originally presented at the October meeting of the American Society for Engineering Education, held in Kingston, R.I. Following his graduation from the Institute, Professor Townsend spent a few years in industry, returning to M.I.T. in 1919 as an instructor in Mechanical Engineering, became assistant professor in 1929, and associate professor in 1937. Professor Townsend has been affiliated with the Lowell Institute School since 1919 and in 1944 became its director.

**Emulation.** — For a quarter of a century the oil that has flowed out of the Middle East to the world's industrial markets has benefited exporter and importer alike. The educational and technological facilities which have enabled Saudi Arabia to emulate more industrialized nations are recounted in "American Technology in Arabian Oil Lands" (page 89) by RICHARD FINNIE. Mr. Finnie has served as historical consultant to the Corps of Engineers. At present he is in the Middle East in connection with construction work for Bechtel International Corporation.



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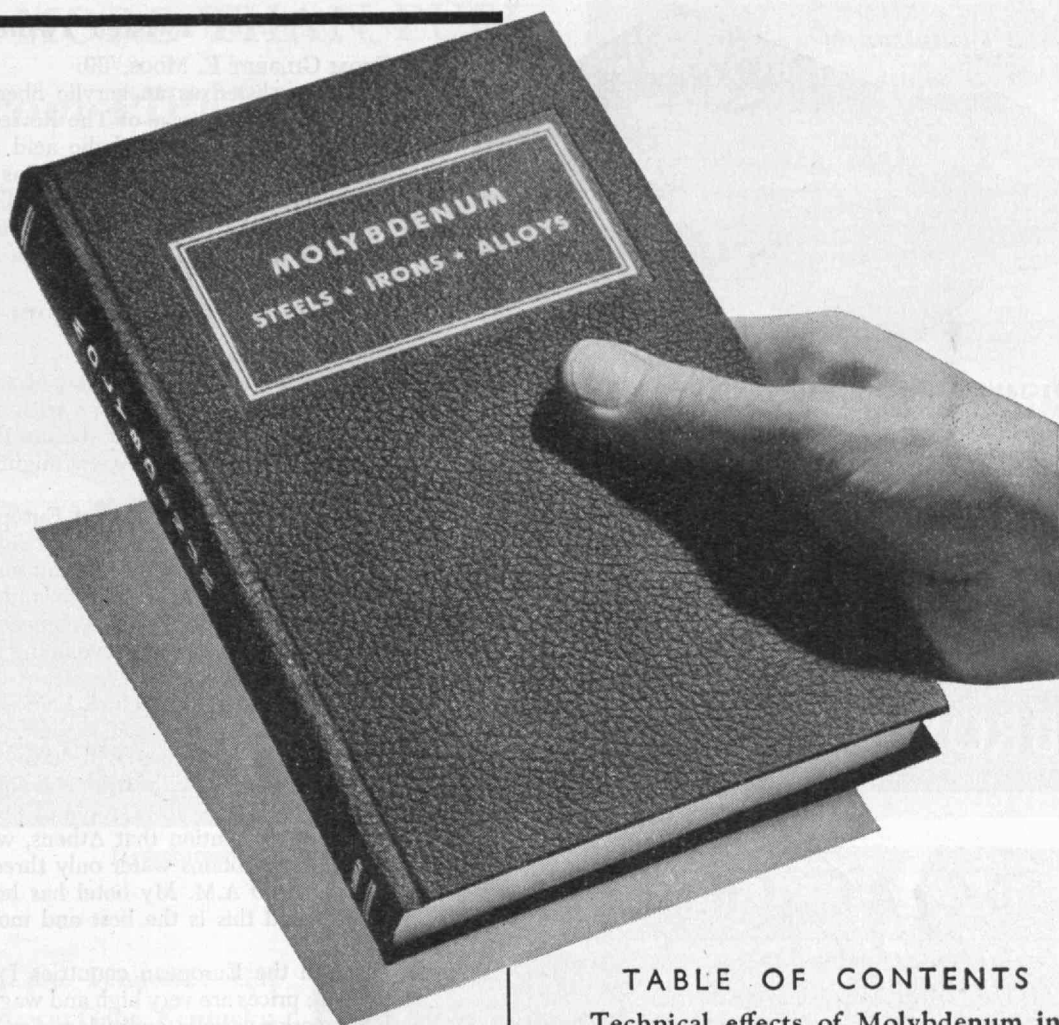
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# DIEFENDORF

# GEARS

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The book is available free on request by metallurgical and engineering students.

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Wrought Corrosion Resistant Steels.  
Wrought Steels for Elevated Temperature Service.  
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Please send me "Molybdenum: Steels, Irons, Alloys".

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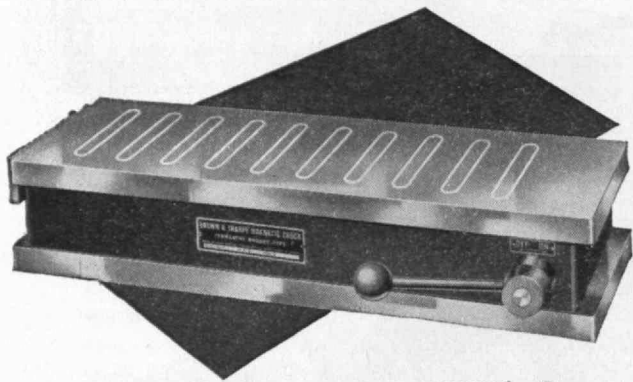
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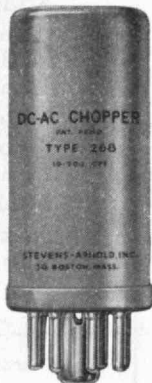
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## MAIL RETURNS

### Twisted Twines

FROM GILBERT E. MOOS, '39:

Dacron, listed as an acrylic fiber on page 13 of the November, 1951, issue of The Review, is actually a polyester made from terephthalic acid and ethylene glycol, rather than an acrylic fiber. It was originally known as Tereylene (England) and Fiber V (U.S.A.). Dynel, Orlon, and Saran are acrylics, however, as mentioned. Cumberland, Md.

### Appreciation from Greece

FROM DAVID E. MORGAN, '39:

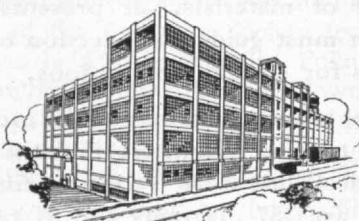
Some of my classmates know of my frequent travels all over the world, in connection with my mining work, and since there are a few hours before the plane takes off for Africa, I thought The Review might be interested in this note.

Greece is the focal spot of European politics, and the United States has poured many millions of dollars into this country. It is most gratifying for an American citizen to be here; the Greeks realize and appreciate what we have done. Our money, our engineers, and our equipment are now in full swing of developing two very large lignite deposits, and building five steam electric power plants which will use lignite as fuel. I am working on one portion of the lignite mine development. When these projects are completed, Greece will have adequate and cheap power, and other industries will follow, if war does not interrupt. To give an example of present conditions, it is sufficient to mention that Athens, with almost 2,000,000 inhabitants, obtains water only three times a week, from 6:00 to 9:00 A.M. My hotel has hot water only once a week — and this is the best and most expensive hotel in Greece.

Of all the European countries I know, Greece is the poorest; prices are very high and wages very low. I wonder how workers, both manual and white collar, can live.

I leave here for North Africa, Spain, France, Italy, Switzerland, Germany, and England.  
*Athens, Greece*

Here's what Avon Products, Inc. said of our service during the last war emergency:



*E. H. Faile, Engineer*

"We were all greatly pleased with the workmanship, speed and efficiency shown by your organization."

If you need a new factory or an addition to your plant, we'll be glad to tell you its cost and how quickly it can be completed.

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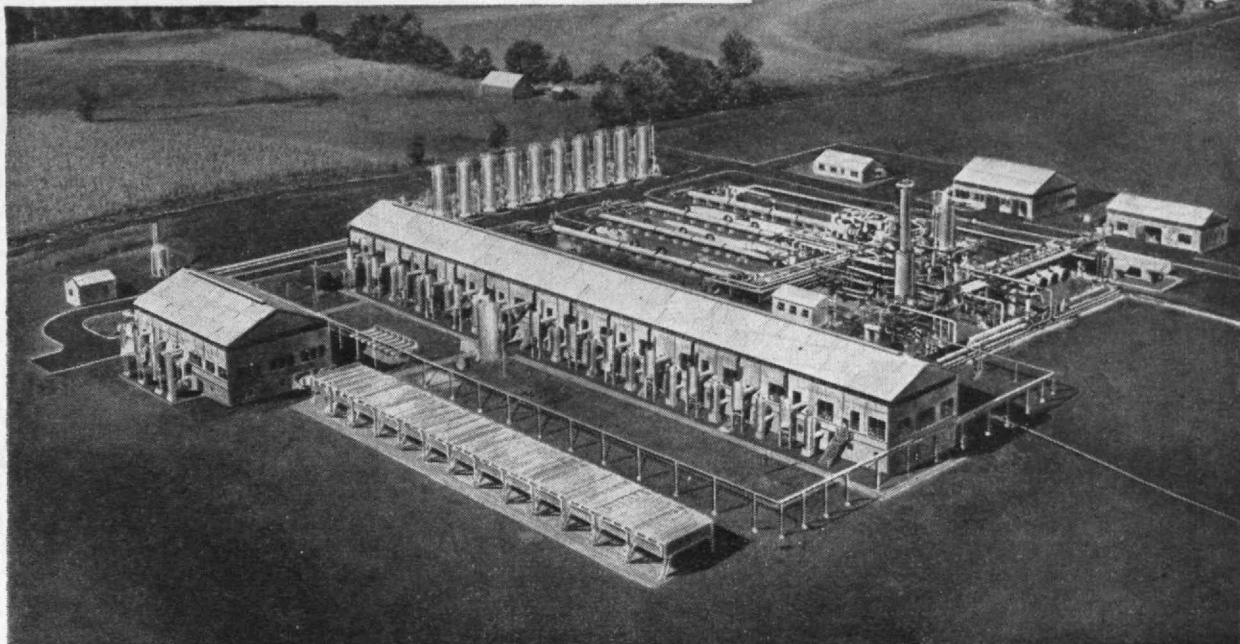
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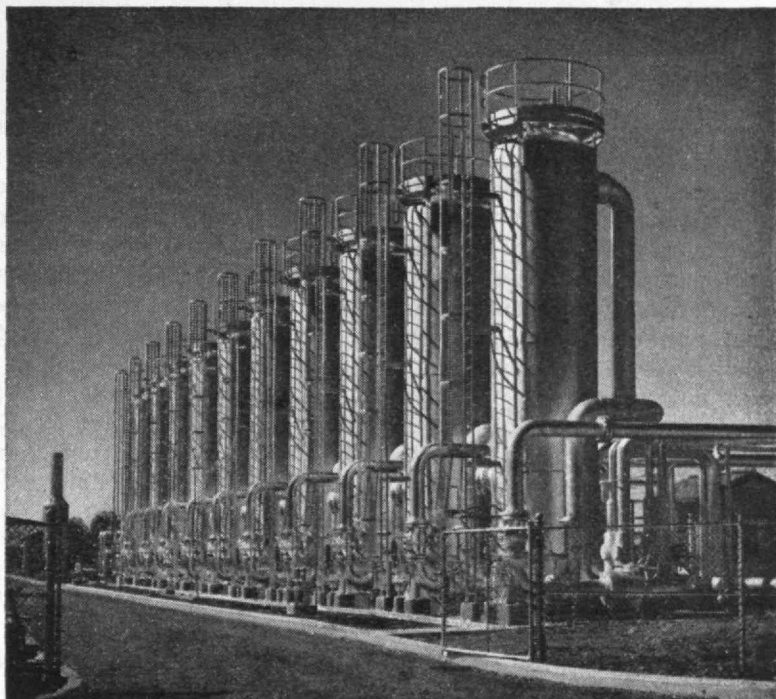
# Getting MORE THAN FUEL from PIPELINE GAS



Hydrocarbon Extraction Plant, Tennessee Gas Transmission Company

This plant of the Tennessee Gas Transmission Company at Gabe, Kentucky, is the first of its kind to be constructed adjacent to a major natural gas transmission line, for the further extraction of bottled gas and aviation and motor gasoline components from "dry" pipe line gas.

Stone & Webster Engineering Corporation made a report and appraisal of the economics, feasibility and best location for the project and was employed for the design and construction of the plant.



Battery of Dehydrators



## STONE & WEBSTER ENGINEERING CORPORATION

A SUBSIDIARY OF STONE & WEBSTER, INC.





Seven years ago this month, Combustion completed building the giant boilers for the Oak Ridge power station.

Today, on the banks of the Ohio, near Joppla, Illinois, another huge power station is under construction. This station will supply a large part of the power requirements of the new atomic production plant now being built at Paducah, Kentucky for the Atomic Energy Commission. And again, the boilers—four of them—are being supplied by C-E. These boilers will rank with the largest ever built and at full capacity will

consume 7500 tons of coal per day.

In addition to the major role it will play in our defense program, Joppla Station marks another milestone in the history of power generation. It will be the first station in the world to go into service with an initial capacity as high as 650,000 kilowatts. Joppla Station is being built by Ebasco Services, Inc., Consulting Engineers, for Electric Energy, Inc.,\* a new company formed by five major electric utility companies to operate this station.

Joppla is another example of the long identification of Combustion

equipment with notable power stations, as well as with history-making advances in power generation. It also exemplifies the design leadership that makes it worth your while to consider C-E Boilers for your steam requirements . . . whether large or small . . . utility or industrial . . . power or process.

**\*Electric Energy, Inc. is comprised of these utility companies:**

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Middle South Utilities, Inc.  
Union Electric Company of Missouri

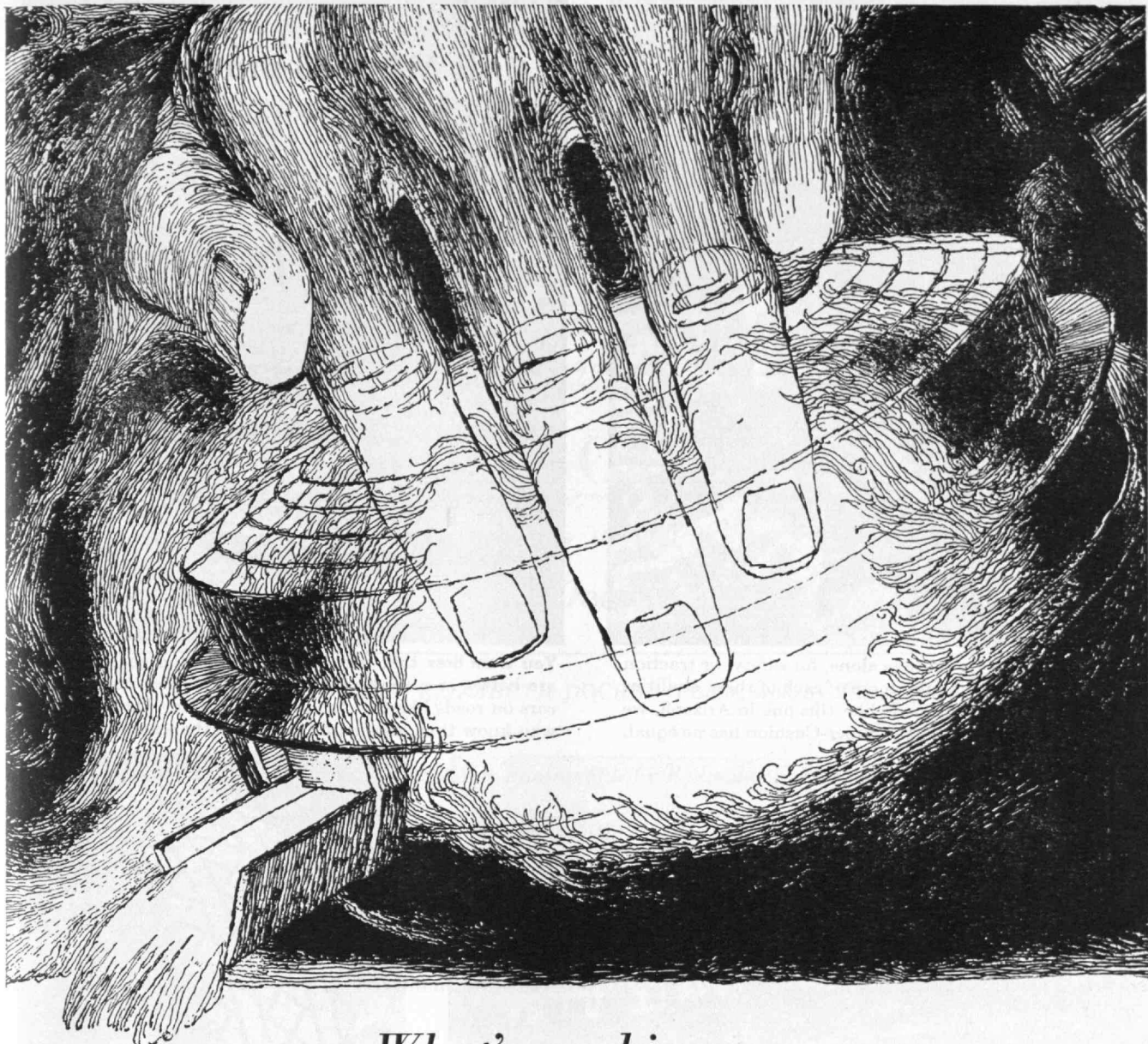
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The fingers? No, they *simulate what's doing* the cooking.

These fingers represent giant rods of carbon—or graphite, carbon's refined cousin—that carry the heat-creating electricity into the furnace. Only carbon or graphite in the form of huge electrodes can do this, and stand up under the terrific temperature of 6,000 degrees or more!

Here, in this roaring cauldron, these fiery fingers are making the alloying ingredients for stainless steel. They are also used to make other tough and hard varieties of fine steel.

But steel making is only one important way in which carbon and graphite serve industry. Carbon arcs fire the furnaces that make calcium carbide—a source of acetylene for many modern plastics and chemicals. Motion picture

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**FREE:** Learn more about the interesting things you use every day. Write for the 1951 edition of the booklet "Products and Processes" which tells how science and industry use the ALLOYS, CARBONS, CHEMICALS, GASES, and PLASTICS made by Union Carbide. Ask for booklet N.



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## AND CARBON CORPORATION

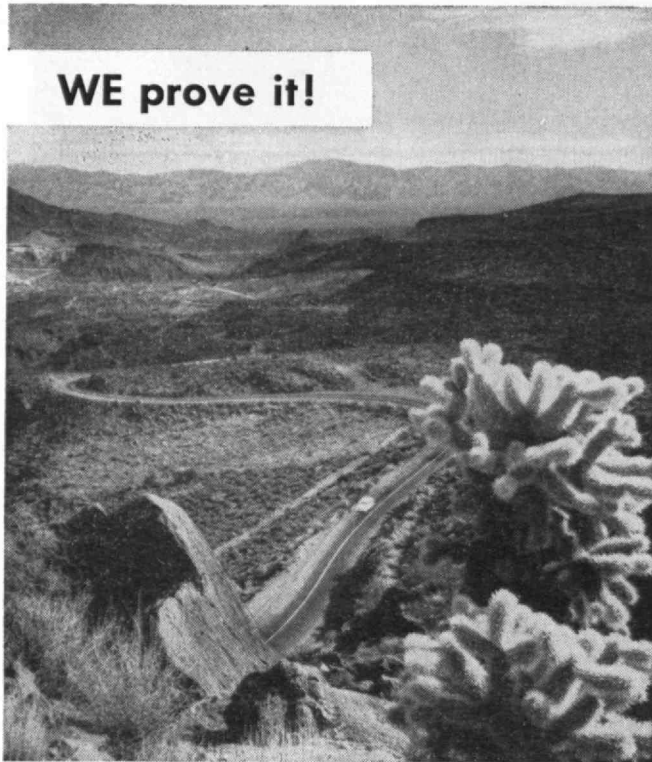
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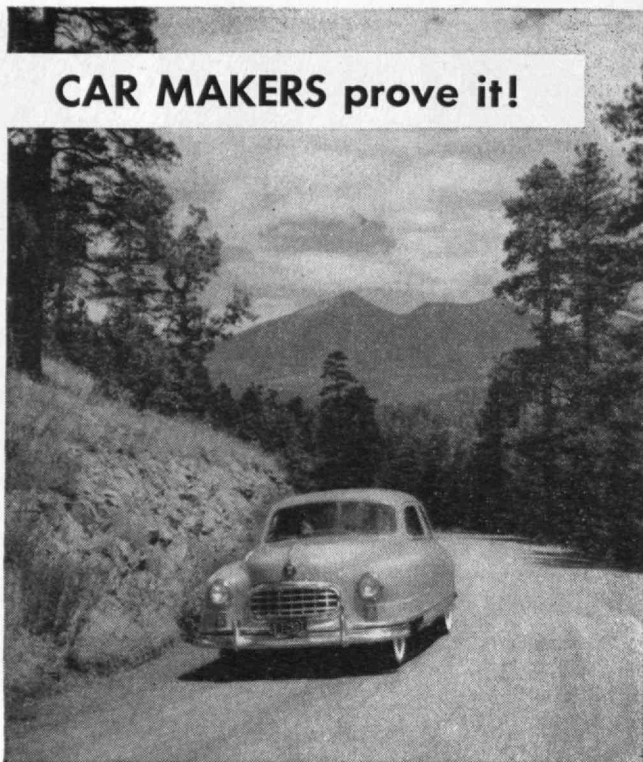


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Black Star

"Say, those Course IV fellows ought to do something about the housing shortage."

# THE TECHNOLOGY REVIEW

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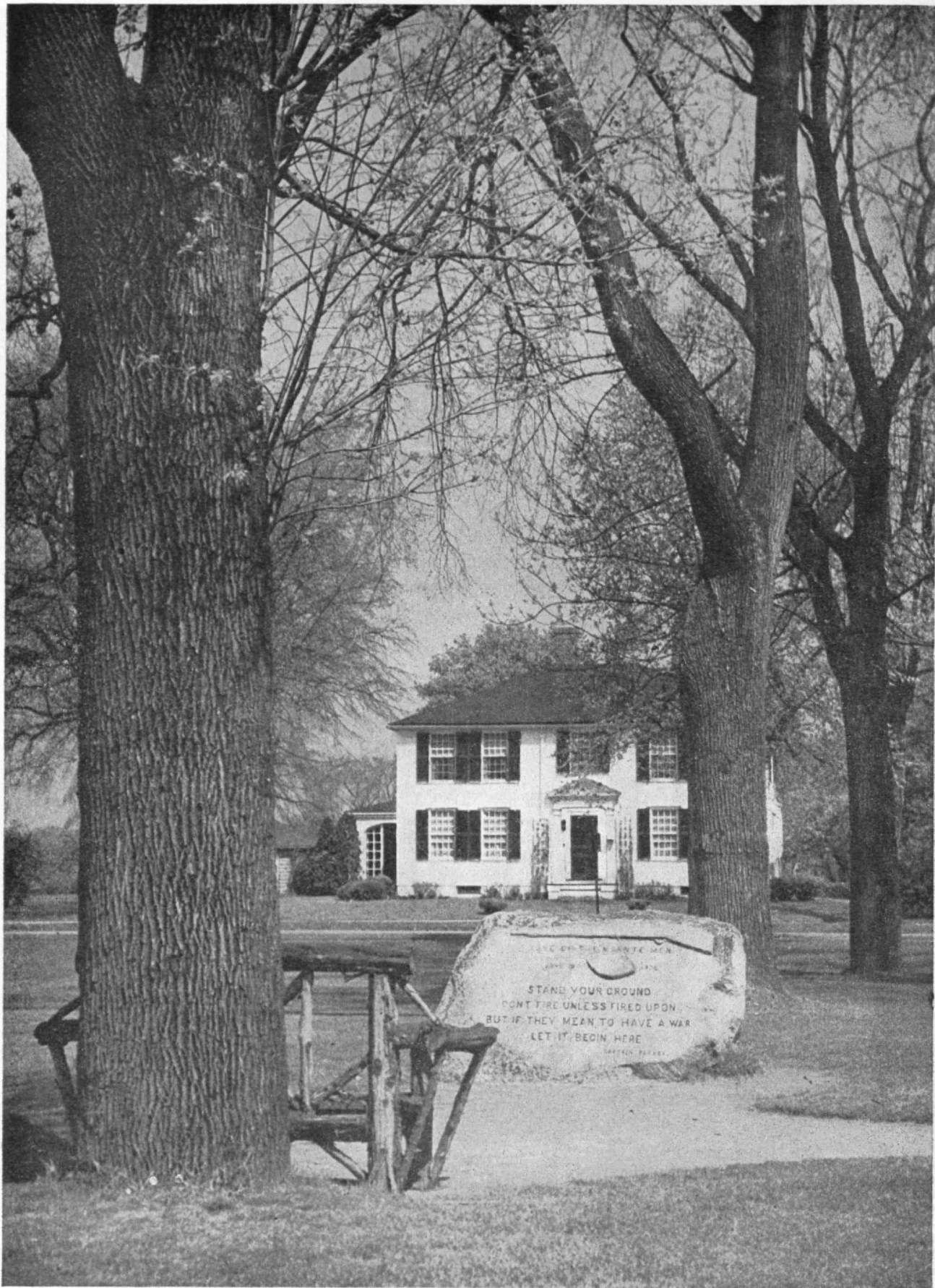
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Raymond E. Hanson

## History Lesson

# THE TECHNOLOGY REVIEW

Vol. 54, No. 2



December, 1951

## The Trend of Affairs

### *Science and Democracy*

THE sixth annual Arthur Dehon Little Memorial Lecture, "Science and Democracy," was given by Sir Henry Thomas Tizard, distinguished British physicist and aeronautical authority, in Walker Memorial on November 5.

Sir Henry Tizard has won international recognition in a career of outstanding achievements in education, research, and administration. From 1911 to 1921, exclusive of his war service, he was a Fellow of Oriel College, Oxford, and lecturer in natural science. He was rector of the Imperial College of Science and Technology in London from 1929 to 1942, and president of Magdalen College from 1942 to 1946.

During World War II, Sir Henry achieved international stature as a military research scientist and as aeronautical engineer and strategist. In 1934 he became chairman of a committee to study science in relation to air defense. Out of this study came the radar defense system which played so large a part in winning the Battle of Britain.

In his lecture Sir Henry spoke of the "anxious interest in the influence of science on society. Science," he said, "has brought benefit and happiness to hundreds of millions of people, and harm to no one. Can it be argued that anyone's life has been made less bearable by the progress of science? The answer may be yes, because of war. But modern war has not been more disastrous than many wars of the past.

"The United States emerged from the greatest war in her history stronger in a material sense, and what is more important, stronger spiritually than she has ever been. She achieved this proud position with the loss of fewer men than met their death in battle and by disease in the Civil War in America less than 100 years ago, when the population was only one quarter of what it is now. Canada has benefited in a similar way. . . .

"The tragedies of war," Sir Henry said, "have not been due to science; they have been relieved by science. Why, then, are we scientists and technologists so anxious about the social implications of our work? There are two main reasons. The first is the haunting but perhaps unjustified fear that if ever war comes again on a large scale the misapplication of the powers of science will be so frightful as to destroy civilization as we know it altogether. The second is that while the application of scientific knowledge has brought such great benefits to mankind it has not brought a fraction of what, in our opinion, should have been possible. . . .

"Thinking men all over the world fear the consequences of the clash between rival political theories and leaders. The natural thing in democratic countries is to blame our politicians, and certainly we have good cause to think that they might often be wiser than they are. Yet I am inclined to agree with Professor Blackett's remark that if scientists became politicians they would act like politicians. But whoever is to blame for this state of affairs, it is surely not the scientists. They have done and are doing their work well.

"If any blame is to be attached to men who have had the great advantage of a university education it must surely be our friends the humanists who must bear the brunt; for it is they who claim that their superior education enables them to deal with great world problems, and with human beings, in a way which is beyond the power of scientists who have been educated in a narrow groove."

Later in his lecture Sir Henry said: "The deplorable intellectual gap that now exists between the students of science and the students of the so-called humanities has been caused by the failure of the humanists to move with the times. . . . Nevertheless the mischief has been done; there is no getting away from it, I fear. The phrase 'humanities' will continue





Post-Dispatch Pictures

In spite of its ominous appearance, the mechanism at the left is not a cannon being placed in position for the protection of Heartbreak Ridge. It is, in fact, a mechanism devoted to much more peaceful activities.

The machine can traverse rough terrain, and the barrel-type structure, 34 feet long, can be raised to a height of 20 feet.

Readers with a mechanical turn of mind might like to speculate on the nature of the creature whose identity will be revealed next month.

to be applied to learning which has nothing to do with natural science; and so we now have the farcical situation that economics is classed among the humanities, but medicine is not. . . .

"One difficulty about higher education in the democratic countries," Sir Henry said, "is that the large majority of men who study science do so with the intention of following a professional career in science. It is seldom deliberately studied as a cultural subject, as is ancient or modern history, or philosophy. . . .

"One of the advantages of the severe discipline of science," Sir Henry said, "is that it makes it easier for a man to educate himself in a broader field if he has a mind to. And certainly there is a very general feeling among scientists that they must take their part in the attempt to solve the many social problems that surround us, and that they have good reason to believe that the part they can play is as significant as it was during the war in the field of military strategy and tactics. But if they are to make their real distinctive contribution they must work as members of teams, showing the same respect for the special knowledge and methods of thought of others as they expect to be accorded to their own. It is only by real teamwork of this nature that we can overcome the formidable obstacles to the steady advance of civilization."

Turning to the effects of political decisions of civilian life, Sir Henry said: "One of the inevitable consequences of the progress of applied science is a steadily increasing executive power of all democratic governments to affect the ordinary lives of citizens. The question whether private enterprise is better than public enterprise is no longer of any debating interest; what matters is where the line should be drawn."

"In democracies it can only be drawn wisely on the basis of experimental results. So scientists, of all people, should not condemn out of hand the political experiments of other democracies; rather should they

study them with the object of adopting what is good, and rejecting what is bad. In this field of politics the great art of government rests in being in constant touch with the best advice available, and then making the experiment so that in case of failure the *status quo ante* can be restored.

"If the best advice is to be available in time, the thinking must be done beforehand, often long beforehand, if crises and snap decisions are to be avoided. Hence the importance of encouraging real teamwork in the social sciences. But I do hold that if science is to have a real influence on national policy, which we all think it should have, some scientists must be prepared to spend part of their lives in the closest daily touch with men who formulate the policy. It is not necessary that they should be the best scientists, so long as they enjoy a reasonable measure of the confidence of more gifted colleagues, and do not retreat too far from the advancing tide of science. What is necessary is that they should study and appreciate all the ingredients of political decisions, including the ingredient of human nature, which is the most refractory material known to science. . . ."

Sir Henry expressed surprise and distress to find in America an atmosphere of pessimism which is not prevalent in England. "Perhaps this is because you sit further back from the well-trodden stage of international wrangles," he said, "and can therefore see things more clearly. Perhaps we cannot see the wood for the trees. But possibly on the other hand, we are right, and you are wrong. England has seen dark days before, and there have been many times in her history when her doom was prophesied. The dark days passed, and the jeremiads were confounded. . . ."

The Arthur Dehon Little Memorial Lectureship, under whose auspices Sir Henry spoke, was established in 1944 with funds donated by Arthur D. Little, Inc., in memory of its founder, the late Arthur D. Little, '85. Dr. Little was widely known for his outstanding pioneering in the application of science

to industry and for his varied and important technical activities, especially in the field of chemistry.

His long interest in provisions for the education and training of young men in the advanced study of chemical technology led to the inauguration of the Research Laboratory of Applied Chemistry at M.I.T. The Chemical Engineering Practice School at M.I.T. also owes its inception to Dr. Little as do the Eastman Research Laboratories for graduate study in chemistry and physics, which were made possible through Dr. Little's untiring efforts as a member of the Visiting Committee on the Chemistry and Chemical Engineering Department at the Institute.

### *Versatile Mosses*

To the gardener peat moss is a soft, dark brown fibrous material which is useful as a mulch and to condition heavy soils. It is also often used as a packing for bulbs, fruits and vegetables, and florists find it helpful in preserving cut flowers. These are familiar applications of a species of moss which has many other more important uses.

Peat moss is the name given to the dead and slightly humified moss which is excavated from peat bogs, dried to a moisture content not exceeding 30 per cent, shredded, screened into specified sizes, and pressed into bales or smaller packages.

Before World War II most of the peat moss used in America came from Europe. When the Germans ravished the Low Countries that source was cut off. It was then that development of the deposits in Canada and the United States began. Of the various fibrous peats that occur in nature, the Sphagnum mosses are the finest. Others are Carex, a member of the sedge family; reed, sedge, and Hypnum moss, still another family of plants.

Sphagnum moss is found in almost every part of North America in deposits which range from a few acres to several thousand, and the supply is comparable to the largest in Europe. A study of peat moss by the Canadian Department of Mines and Resources shows that it owes its usefulness to an extraordinary combination of qualities, including high absorptive capacity for liquids and gases, resistance to decomposition, low conductivity of heat, elasticity, and its ability to deodorize. The Canadian report states that there is also some evidence of its satisfactory use as an acid disinfectant.

Farmers in many parts of the country are well aware of the value of peat moss in agriculture, especially for stable bedding and in poultry pens. They also use it as a soil conditioner, and it is employed as a filler in commercial fertilizers, which would burn plants in the pure state. The fibrous peats, such as Carex, sedge, and Hypnum, as well as reed peat, are very high in plant food, and this is their most valuable use.

Peat moss is also used as a constituent of some stock foods. In the building trade it has proved useful for insulation. It does not readily ignite and keeps buildings warm in winter and cool in summer. It is also effective for soundproofing, and vermin do not thrive in it. In Germany boards of compressed peat are impregnated with chemicals to make them fire

resistant, and in Alberta, in western Canada, there is a considerable production of boards made from peat moss, and several thousand houses have been insulated with this material.

One of the most useful applications of the moss is for packing perishable products. Because of its excellent insulating qualities it gives protection against frost in winter, while in summer chilled fruit and vegetables packed in moss keep fresh for a long time. Pads made of peat moss are used for shipping asparagus cuttings and for keeping vegetables unimpaired, moist, and crisp.

The moss is also used in the production of metallic magnesium and a large part of Canadian peat is employed for this purpose. It is also excellent for preserving food, for hard fruit and vegetables packed in it can be kept in good condition throughout the winter. Potatoes, onions, and other vegetables do not sprout prematurely when packed in moss, nor will fruit and vegetables give off offensive odors.

Eggs stored in moss have been found to be in excellent condition at the end of six months, and meat and fish have been kept in it for two weeks or more.

During the war, fruits, such as oranges and bananas, as well as eggs packed in finely screened peat moss, were shipped to wounded soldiers in England. Reports revealed that the fruit arrived in excellent condition and that the eggs stood the boiling test with no sign of musty flavor.

The Indians of northern Canada have long known the value of peat moss, and they use it for various sanitary purposes. The cradle boards on which their babies are carried are filled with the moss. It is often used for bedding, particularly for insulation on the ground. Mixed with clay, it has been used very effectively for filling the crevices between the logs of northern cabins, and its effectiveness as an insulating material for walls and floors has been demonstrated during prolonged spells of temperatures as low as 30 degrees below zero. In Europe, on farms and in small communities, peat moss has long been used as a deodorant in household sanitary systems and cesspools.

After special treatment, peat moss makes excellent surgical dressings and was used in World War I by both the armies of the Allies and the Central powers. It was found to be an excellent substitute for absorbent cotton for surgical purposes, and peat batting was used during the war in France for bandaging. It was also used for mattresses, pillows, and upholstery in military hospitals. The moss may be used over and over again by washing and drying.

Peat moss, the Canadian report indicates, has many potentialities as a substitute for materials in short supply. It can be used as a substitute for cork in the insulation of aircraft. It makes an acceptable filler in linoleum and can be produced in the form of a yarn for coarse blankets for cattle. Peat fiber mixed with wool has been used for the manufacture of underwear which is said to be warmer than the all-wool product. It can also be used in making paper and cardboard, and as the raw material for various chemicals, waxes, alcohol, and dyestuffs.

As a constituent of building brick it produces a product of high porosity which is light in weight with good heat and sound insulating qualities.



# What Kind of Incentives?

## *Any Form of Taxation That Removes the Rewards for Personal Achievement Tends to Weaken a Nation's Vigor*

By CRAWFORD H. GREENEWALT

**T**HERE can be no argument about the fact that the American economy is the strongest and most dynamic the world has ever seen. Some attribute that high position to our natural resources; some to the inherent vigor of our people; some to our large land area. These are important but they are certainly not the whole story, for if they were, many other nations would be our equal and some would perhaps have shown even greater progress.

There seems to be little doubt that this nation's greatness is due simply to this fact: under our principle of individual liberty, human incentive has been given its widest possible scope. To each of us has been given the opportunity to do his best; to each, the right to retain the fruits of his labors; to each, the responsibility of preserving those rights for his neighbor.

### *Creation of Human Hands*

The United States stands today as the summation of individual endeavors. It is the combined result of the efforts of many millions of men and women, past and present, striving for goals that seemed good to them. We see before us the finished structure, but we fail sometimes to remember that each block in that imposing building has been placed in position by human hands.

All human accomplishments are important, in varying degree, but the achievements of a limited few have been very great indeed. This is to be expected, for in any field of endeavor, some will lead and some will follow; some will succeed conspicuously, some moderately, others not at all. All contribute to the common good, but the few at the top of their respective fields contribute in an extraordinary degree, since great individual success is never attained without bringing a measure of that success to many others.

Like the neutrons in the atomic pile at the West Stands of the Stagg Field in Chicago, individual accomplishment marks the beginning of a chain reaction extending its influences far and wide. The reward to that individual, no matter what form it may take, or what its amount, is quite negligible in the sum total of the benefits his abilities may bring about. A few examples will illustrate this point.

Henry Ford acquired a great personal fortune. Yet it would be counted small when measured against the benefits his genius for mass production created—in terms of employment, profit, and enjoyment for millions of people.

Albert Einstein is one of the world's great scientists. Whatever he may consider his rewards to have been,

I doubt that they would begin to compare with the impact of his genius upon scientists and laymen alike the world over.

And in the arts, can anyone doubt that the rewards of a Caruso or a Kreisler are as nothing to the pleasure they have given to the millions that have heard them?

### *Bargains in Benefits*

The point is that rewards for individual achievement, no matter what form they take or what their amount, are at bargain-basement levels when measured against public benefits. That nation is strongest that provides whatever incentives are needed to make its people do their best. That nation is weakest that fails to utilize the tremendous power of self-interest.

Human incentives are simple, and relatively few in number. Most of us derive personal satisfaction from a knowledge that we have done our best, and some would consider this inner satisfaction as adequate reward. Some strive for the prestige success will bring, for the admiration and respect of their fellowmen. Some work for power and the influence so obtained over the lives and activities of others. But for most of us, probably the strongest and most desirable incentive of all is financial gain—not, of course, in money itself, but because of what one can do with it.

### *Use Isn't Important*

What we do with our financial reward, or why we want it, is of no real importance. One man may want a yacht, another may want to endow a hospital, a third may want security for his children. What is important is that he do his best, for only then can the nation reap the greatest benefits from his abilities.

We should also recognize the importance of financial rewards in balancing other types of incentive, and so insuring able candidates for every field of endeavor. Personal prestige, for example, is more likely to accompany success in the sciences, in universities, or in the professions than it is in business. Were we not able to offset this by increased financial reward, business would have much greater difficulty filling its ranks with able people.

Industry and those who share its benefits must compete, after all, for a share of the able and the talented; it is the old familiar problem of supply and demand. If financial rewards decline in attractiveness, we will see many of our ablest people selecting those fields where incentives are of a different kind. The loss to industry will be serious, and industry's capacity to serve the nation will be reduced accordingly.

Much has also been said about the vulgarity of the money motive, but it is doubtful if one could find a cleaner or more honest basis for rewarding high performance. A desire for power is surely less worthy, and it is hard to believe that efforts simply to win the admiration of the crowd are ethically more desirable. It is distressing to see financial incentives weakened by ever more steeply progressive personal income taxes. If financial incentive is the strongest of the incentives we have to offer, it must of necessity follow that the nation's vigor will be weakened by its removal. And it is for the nation, not the individual, that we should be primarily concerned.

If we were faced here with a clear-cut choice between incentives for our able people and abandoning a large share of our present government activities, the decision might be at least debatable. But no such choice is forced upon us. The amount of revenue obtained at the cost of our incentive system is pitifully small.

Most of us are aware of the movement in the state legislatures which would limit Federal taxes on any individual to 25 per cent of his income, except in time of war. Whatever the merits of this proposal may be, two points can surely be made: financial incentives would be largely restored, and the loss in revenue would be small indeed. For 1948, the most recent year for which figures are available, the amount of taxes, collected in excess of 25 per cent would come to about 1.1 billion dollars, a mere 2½ per cent of the total Internal Revenue collections. At the proposed rate of expenditures for the fiscal year 1951-1952, this sum would run the government for less than one week. Surely this is a meager result for which to endanger the will to accomplish, the desire to reach the top.

### *Present Company Excepted*

This analysis makes no special pleading for the group of men who now manage our business enterprises. Frequently the reports of stockholder meetings include the statement that if executive compensation were not as high as it is, there would be danger of losing existing management to other businesses or to other professions. That those statements are fully justified is questionable. The Harvard Business School published recently quite a thick volume concluding that present executives work quite as hard and strive just as diligently in spite of substantial reductions in their after-tax salaries. I am sure that that is so — that out of a sense of loyalty or a feeling of obligation to their companies, or perhaps simply because of habit, the current crop of executives will continue to do their best.

Therefore while we may be quite willing to shed a tear or two for the plight of our present business leaders, I doubt very much that their present financial situation, and the actions they will take because of it, will be in any important way harmful to the nation's progress. The great question is — who will take their places? What caliber of men will be managing our business enterprises 25 or 50 years from now? How can we assure their competence and vigor in the face of greatly weakened financial motives? It is on the answer to that question that our country's future depends to a great extent.

### *Ladder of Advancement*

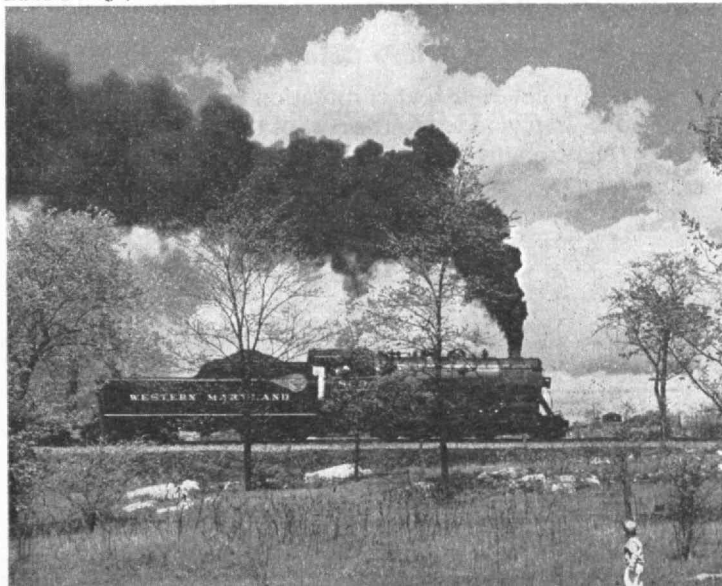
In the Du Pont Company we have 16 well-defined levels of responsibility from wage-roll employee to president. Obviously it is vital that for each successive level in that ladder of advancement there be available as many promising candidates as possible. To insure that result, we have attempted to maintain over the years adequate differences in pay for each step upward. But the pleasure of paying higher taxes is probably not much of an incentive and unfortunately the increases after taxes have become less and less as the level of responsibility increases. We are seriously concerned that our promising young people may not consider the competitive race worth their while.

Let us look at the problem from a specific point of view. Somewhere in our organization is the man who in the years to come will succeed me in my present position. I do not know his name, but I do know something about him. He is perhaps five to 10 years younger than I and is probably a junior executive in one of our departments. If we are fortunate, he will be chosen from a number of sound and promising candidates, each willing and anxious to assume the highest responsibility. Perhaps the problem of his selection will not present too many difficulties. But what about his successor? He may also be somewhere in our present organization, perhaps a chemist in the laboratory, a salesman in a branch office, a foreman in a plant. If money incentives fail, will there be enough candidates from which to make a sound choice? Will their motives be healthy and honest and of a nature that will not slow our progress?

Two points seem to be plain. If the financial incentive is absent or greatly reduced, the number of candidates for top-management positions will decrease, since many men who would otherwise have entered the competitive race will have gone into vocations where the rewards seem to them more desirable. And the motives that remain seem less likely to produce the best in management for our business enterprises. Certainly the desire for power, or the desire for prestige, or admiration, are not characteristics that would

*What caliber of men will be managing our business enterprises 25 or 50 years from now? . . . How can we assure their competence and vigor?*

*Edward Hoff from Black Star*





be expected to lead to the kind of competence we need in business management — the competence which creates a financially successful enterprise.

### ***Substitute Incentives***

Many substitutes for financial incentive have been tried in other countries. In England there are titles, and the head of a large corporation is frequently Lord So-and-So or Sir-Something-Else. Elsewhere much is made of social distinction or of personal prerogative, honors, or uniforms. Some of these are relatively harmless; others are to us merely distasteful; none of them is in harmony with our democratic society.

There is no short-term remedy. The solution is one for the long term and will depend on informing our people in a manner that is sound, objective, and free of bias or political controversy. That is everyone's responsibility. We may as well admit that as individuals our primary motivation is self-interest; we cry when we are hurt. We don't worry much when we think it's the other fellow. So, as government spending increases, small taxpayers yawn politely, serene in the assurance that the bills will be paid by someone else.

Undoubtedly much could be gained, therefore, if people knew the whole truth about our present tax system. When they do, they will realize first that weakening of incentives hurts everyone, not just the more successful minority. And they will discover, most importantly, that the high cost of government is not being paid by the few but by the many — that it is their pockets that are being tapped.

Everyone knows that personal income taxes come out of his own earnings. Probably few know that aggregate personal income taxes are now scarcely 50 per cent of total Federal taxes. Most people also know they are paying the excise taxes that are being levied in increasing numbers. It may also be understood that the burden of excises in general falls on rich and poor alike in proportion to their expenditures.

The writer believes, however, that there is much misunderstanding as to who really pays the corporate income tax. I do not mean the so-called excess profits tax which we are told is a temporary measure, covering, we hope, a short period only. I refer to the normal corporate tax which many people believe is paid in some obscure way by a special and limited class. Even from reputable economists and businessmen we hear the corporate tax described as "double taxation" as if it were in fact a tax imposed upon the stockholder.

### ***Who's Going to Pay?***

It seems clear that corporation taxes in the long run are simply added to the cost of the goods and services the company has for sale. Just as prices must recognize an increase in labor and materials cost, just so must they take into account taxes levied by government, for any business must earn a profit if it is to survive. That profit, furthermore, must be adequate to attract the capital necessary for growth and development. It is the customer at retail who must eventually pay the bill.

The best evidence that this is true can be seen by examining the historical course of corporate earnings after taxes. Except in abnormal periods, industry's profit after taxes remains relatively constant, what-

ever the rate of the levy. In the mid-twenties the net profit after taxes for all United States corporations averaged around 4.4 per cent with the Federal corporation tax at about 13 per cent; in the three postwar years, 1948, 1949, 1950, with taxes at 38 per cent, the net profit after taxes averaged 4.4 per cent.

Much more evidence can be brought forward, but when all the facts are taken together, the inescapable conclusion is that the consumer pays. And so the corporation tax becomes little more than a concealed sales tax.

This does not necessarily mean that prices are always increased as taxes go up. In certain old-established industries, perhaps that is so. We have, however, been living in an age of rapid technological development. For many products and many companies corporate income taxes have been offset by economies resulting from new technologies. Taxes in these cases have merely siphoned to government cost reductions that would otherwise have reached the general public.

### ***Taxation in Sneakers***

The net result of recent Federal tax policies is that we are much closer to a system of proportionate taxation or, if you will, to the old system of tithing, than we think. Whatever the percentage of national income taken in taxes, you may be very sure that the ordinary citizen is himself paying, directly or indirectly, very close to that percentage. The figures would show that the number of those who pay more than the average are very few, and the aggregate amount they pay, in comparison with the total bill, is negligible.

The facts of Federal taxation are scarcely open to question, but I do not see that it is in the national interest to perpetuate and multiply a fiction. Taxation in sneakers is just as real and just as costly as taxation in hobnail boots. The use of concealed taxes is a sorry device to hide the fact that personal income taxes can no longer pay the bill. The rich, near-rich, and near-near-rich have by now been milked almost dry. It is startling to see, as Roswell Magill, tax expert, has pointed out, that outright confiscation of everything over \$4,000 of annual income would net only ten billions of dollars — less than enough to operate our inflated Federal Government for two months.

So the average citizen pays. We have gone far past the point where a selected few can do it. It seems to me poor ethics, bordering on dishonesty, to delude the public with the idea that our Washington wizards have succeeded in shifting the burden to some mythical "other fellow." There is little to be gained by berating the administration or our representatives in Washington for Federal spending and governmental extravagance. Those in public office, after all, reflect what they consider the wishes of their constituents to be. For that we cannot blame them. They are the elected or appointed representatives of the people and are sent to Washington to act in their interest.

### ***Tell Them the Truth***

But we can fairly criticize government's unwillingness to tell the people the realities of the burdens they are asked to assume. It is as if they had no confidence  
(Concluded on page 110)

# Medical Marvels in Korea

*A New and Impressive Record of Medical Achievements  
Is Being Established in the History of Warfare*

By JAMES A. TOBEY

**W**HEN the advance units of the 24th Infantry Division of the United States Army were landed hurriedly at Pusan in the first days of July, 1950, they were confronted by two formidable enemies. One was the North Korean Army, 100,000 strong, well-trained, and equipped with the latest Soviet guns and tanks. This army had surged across the 38th Parallel less than a week earlier and was sweeping everything before it. Seoul, the South Korean capital, had been taken in three days.

That other potent enemy was one which has plagued armies throughout history. It was disease. At the time of the invasion, as always, Korea was one of the most pestilence-ridden areas on the earth.

Everyone is familiar with the difficult and magnificent delaying action fought by General Douglas MacArthur's hard-pressed troops in those first precarious weeks in Korea. Few are familiar with the remarkable story of our successful campaigns against disease and against fatalities from battle wounds.

In the first six weeks of arduous combat in the dust and heat of Korea, the American forces were driven back to the Pusan beachhead. Then on September 15 came the brilliantly conceived and executed landing at Inchon, followed by the breakout from the perimeter at Pusan by the Eighth Army, and the slow but relentless drive to the north. By late November, the troops of the United Nations held almost all of Korea to the Yalu River along the Manchurian border. The North Korea invaders had been defeated by the combined efforts of our foot soldiers, our Air Force, our Navy, and our Allies.

But a new and more violent conflict began on November 26 when the Chinese Communists entered the fray. They recklessly threw, into the battle, nearly 300,000 fresh, experienced, and well-equipped troops, backed up with modern tanks and heavy artillery. Before this torrent of expendable man power and armor, the Allies had to give way, but not for long. In January our forces again launched their slow, punishing advance, slaughtering Communists as they went. By July, 1951, when the weary foe said it was ready to discuss cease-fire terms, most of his forces were well north of the 38th Parallel.

This, in brief, is a résumé of a year's fighting in Korea. It is a story of gallantry and bravery among the soldiers, sailors, airmen, and marines of many

nations allied in the cause of freedom, who fought under the most adverse conditions in a climatically unfavorable, disease filled, primitive environment.

Equally thrilling is the story which has not been told; the story of the conquest of disease among our troops in Korea, and the narrative of a notable system of military medicine which has achieved new and gratifying records in the evacuation and effective treatment of our wounded soldiers.

In World War I (1914-1918), we had an excellent medical organization which performed a most commendable job, but in that conflict 80 out of every 1,000 wounded American soldiers died of their wounds. By the time of World War II (1939-1945), military medicine had made such progress that only 45 of each 1,000 succumbed to their wounds. In Korea (1950-1951), during the first year of the fighting, an even better ratio has been achieved, that is, only 25 per 1,000. It seems, then, that thus far 975 out of every 1,000 wounded have survived — a record which, if maintained, will be a new and impressive one in the history of warfare.

A number of factors have been responsible for this noteworthy accomplishment. Among them have been the prompt administration, on the battlefield itself, of precious whole blood and blood plasma donated by the people back home through the American Red Cross and flown under refrigeration to the battle front;\* the prompt use of the newer antibiotics and therapeutic chemicals; the prompt collection

\*Evans, Robley D., and Gibson, John G., 2d, "Radioactive Blood Cells," *The Technology Review*, 49:91 (December, 1946).

Acme photo by Walter Lea



*Among recent innovations which assist in reducing the tragedy of modern warfare is the use of the helicopter for evacuation, to hospitals in the rear, of wounded soldiers.*



and evacuation of the wounded, often by air; the prompt treatment of the wounded by skilled physicians and surgeons in well-equipped medical installations in the rear; and above all, an efficient organization of well-trained, devoted army medical services under able and inspired leadership.

One of the important factors in the saving of the seriously wounded, which is a result of the experience in Korea, has been the use of the helicopter and other light aircraft to collect and evacuate these wounded. By this means they are transported in a matter of minutes to mobile army surgical hospitals instead of being exposed to a grueling ambulance journey of hours over the rough trails that pass for roads in this mountainous area. In the early days of the campaign, when units often were cut off by the enemy, a resourceful medical officer borrowed a helicopter from the United States Marines and brought out 40 badly wounded men under the fire of the enemy. Subsequently, whole fleets of helicopters were employed for this purpose.

When a soldier is wounded, he first receives assistance from the company aid man attached to his unit, who gives competent emergency medical treatment, tags him, and, if the injured man can walk, the aid man directs him to the battalion aid station. If he cannot walk, he is picked up by litter bearers and is carried toward the rear. At the aid station he is examined by a medical officer, given necessary emergency treatment, and either returned to his unit or prepared for further evacuation. Usually, his next trip is by ambulance, but it may be by improvised jeep or truck, or by litter, to the regimental collecting station. Here the casualty is examined again, treated, and prepared for further evacuation, this time to the clearing station of the medical battalion of his combat division. After any necessary care, the wounded man is then transported by ambulance, train, ship, or air to an appropriate field hospital in the rear.

This is the usual and the textbook routine, but in many instances in the field some of these steps are by-passed, and a wounded soldier may be brought by helicopter to a mobile army surgical hospital be-

hind the lines. Within less than a month from the day he was seriously wounded, a Korean veteran may be in one of our great permanent army hospitals.

The medical service officers, army nurses, sanitary engineers, and medical corpsmen who performed these medical marvels in Korea were hastily assembled from medical installations in Japan, and flown over in the first days of the hostilities. They were, of course, quickly augmented by medical reinforcements from the United States; many of them were veterans of World War II; others were new to the game. Over-all director of these activities was the chief surgeon of the Far East Command and chief medical officer of the United Nations Forces, Major General Edgar E. Hume, Medical Corps, United States Army, a physician who was graduated from the Course in Public Health at M.I.T. and Harvard in 1921.

These medical soldiers operated under harrowing conditions in rugged terrain that was hot and dusty in summer, and bitterly cold and wet in winter; the country was devoid of decent roads, and exposed to a foe who had no respect whatever for the Red Cross emblem. It was necessary, in fact, to eliminate the white background of the red cross on hospitals and ambulances, since it served so often as a target for the barbaric Communists. Wounded enemy prisoners of war, on the other hand, have been accorded the same capable medical care given to our own forces.

Added to the perils of the American wounded in Korea has been the fact that often they were forced to lie on ground contaminated with all kinds of dangerous bacteria and parasites — the spores of tetanus, the bacilli of typhoid and dysentery, the larvae of hookworm, and a host of other micro-organisms and parasites. And yet our soldiers, routinely immunized against typhoid and paratyphoid, tetanus, and smallpox, and in Korea and the Far East against cholera, typhus, and Japanese B encephalitis, rarely contracted these lethal and disabling maladies.

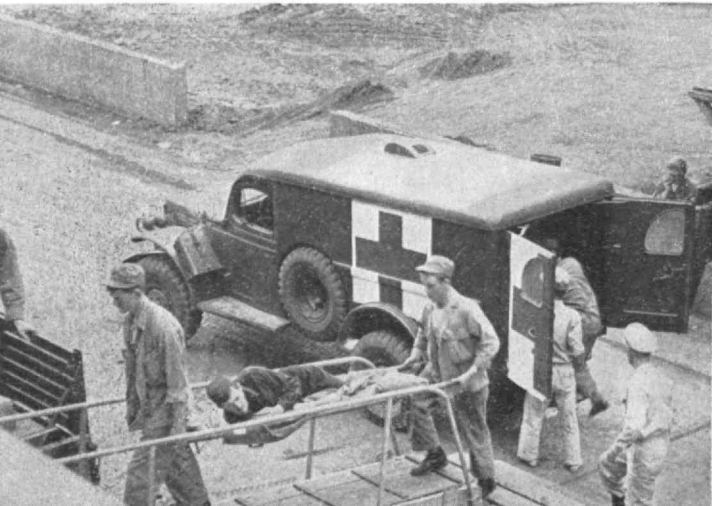
Diseases now seldom, if ever, encountered in the United States are, and seemingly always have been, rife and rampant in Korea. Although the Japanese endeavored to improve health conditions during their rule in Korea from 1910 to 1945, and the American military government struggled with the problem from 1945 to 1948, no substantial progress could be made. Preventable diseases, such as the deadly typhus fever, cholera, leprosy, typhoid fever, dysentery, smallpox, meningitis, relapsing fever, and encephalitis were and are both endemic and epidemic in Korea. Added to these are other and more familiar scourges, such as malaria, the venereal diseases, tuberculosis, and a legion of others. It is estimated, furthermore, that intestinal parasitism is almost universal in the Korean population, and that everyone suffers from helminths, such as hookworm, tapeworm, roundworm, threadworm, whipworm, liver flukes, lung flukes, and intestinal flukes. Some of these parasites have been found in practically every wounded prisoner of war.

Since there is little, if any, sanitary disposal of human excreta and wastes in Korea, and infected night soil is commonly used as fertilizer, opportuni-

*(Concluded on page 112)*

*United States Army medical corpsmen load a wounded American soldier aboard a Japanese hospital ship at a South Korean harbor. Prompt transportation of the wounded from the war zone to well-staffed hospitals in the noncombat areas has been an important factor in the health program of United Nations powers.*

*Acme photo by Norman Williams*



# The Lowell Institute School

*The Remarkable Will of a 37-Year Old Bostonian  
Has Had a Profound Influence on New England  
Adult Education for More Than a Century*

By ARTHUR L. TOWNSEND

THE Lowell Institute Foundation is a unique educational enterprise which has been operating in the Boston area for something like 115 years. Born of the remarkable wisdom and foresight of a Bostonian whose primary objective was the betterment of his fellow men through education, and capably administered by his descendants, the Foundation has grown conservatively and soundly throughout the years, in true New England manner. At the present time the Foundation supports or conducts lectures of high caliber on a wide variety of cultural topics, it operates a broadcasting station whose educational programs tap the resources of colleges and universities in metropolitan Boston, and it conducts an evening school of instruction in engineering subjects. All of these activities are ably carried on without the Foundation owning buildings or other physical assets. But to fully understand this unusual — if, indeed, not unique — venture into adult education, it will be necessary to review the educational and social conditions in the United States at the time the Foundation was established.

Around the year 1800, New England in general, and Boston in particular, were still operating under a number of puritanical laws and influences. Many of the social enterprises, especially as we know them today, were nonexistent. There was little entertainment. The theater was frowned upon, as it had been for decades. As a matter of fact, it had been outlawed in the community for a number of years and only toward the end of the Eighteenth Century did it again acquire legal standing. When the theater was reinstated, however, it was unfortunately revived as a cheap, tawdry institution and was not attended by the better class of people. Facilities for public education, likewise, were not too abundant in the United States in the early Nineteenth Century. Public demand for wholesome entertainment and education, therefore, was supplied largely by the lecture system. Public lectures on all manner of topics soon became so popular that anyone who could present a reasonably good address was dragooned into giving entire series of lectures. Doctors, lawyers, ministers, teachers, and travelers in foreign countries were engaged by lecture bureaus or agents, who would schedule a set of lectures to be given at a specified time and place for a fee. A good lecturer who presented his address in an interesting and authoritative manner could

easily build up a large following, and such lectures would be profitable to audience and lecturer alike. But many lectures were poorly given, and many more were poorly managed. As a result, the public's interest in lectures began to wane. To counteract this trend, it became customary to interlard educational lectures with entertainment features such as performances of jugglers and acrobats.

Into this era John Lowell, Jr. was born in 1799. He was the son of Francis Cabot Lowell, for whom the city of Lowell is named, and who introduced production machinery into the manufacture of cotton goods. John Lowell, Jr. received his early education in Scotland and, at the age of 14, entered Harvard University with the Class of 1817, but because of poor health he did not graduate. It is true that he was born of an excellent and prosperous family. At the same time, however, he proved to be a very energetic and enterprising young man who achieved success in business, as well as in politics. He was elected to the Common Council in Boston and several times to the Legislature. He traveled considerably abroad, both in England and in India, and was a cosmopolitan, public-minded gentleman. Throughout his life he was deeply concerned with improving, generally, the lot of New England people, particularly from the educational point of view.

Tragedy entered the life of John Lowell at an early age when his wife and two daughters died within the same year. Full of sadness, and with the desire to improve his health, John Lowell, at the age of 34, decided to take a trip around the world, following the peregrinations of Marco Polo. Before starting on the trip, he wrote a will which is remarkable for its wisdom, foresight, culture, and public-spirited beneficence. In his will John Lowell recognized that "the New England soil is sterile and unproductive. The salvation of its people is by education and intelligence." Desiring to foster education in New England, John Lowell, Jr., left \$250,000 (one half of his total estate) for this purpose and stipulated that the income should be used to provide free "public lectures to be delivered in said City of Boston, for the promotion of the moral, intellectual, and physical instruction and the education of the inhabitants of said city." He not only provided financially for the lectures but, among other things, told what subjects should be given, how the lecturers should dress and behave



themselves, and specified the manner in which admission could be obtained. He stipulated that 10 per cent of the income was to be added each year to the principal so, as he put it, the fund would never be denuded. He stated very clearly his wish that none of the funds should be used for bricks and mortar; in other words, all available funds were to be used for intellectual advancement and not for the erection of buildings. He also stipulated that the trustee of the fund should be a descendant of his grandfather, Judge John Lowell, and was to be a male descendant bearing the name of Lowell, of impeccable character and a man perfectly competent to carry on the administration of the trust fund. The will was so remarkable and unique that his lawyer protested that there was no one who could carry out its provisions. John Lowell immediately countered that his brother-in-law, John Amory Lowell, could easily do so without any trouble at all.

Shortly after drawing up this remarkable will, John Lowell, Jr. started out on his trip around the world. At Luxor, in Egypt, he wrote a letter which became the codicil to the will. In this letter he expressed the wish that when the funds had accumulated to a sufficient amount "more erudite and particular lectures for advanced pupils" would be given for which an admission fee, equal to the price of two bushels of ripe wheat, could be charged. He then left Egypt for India. In sailing across the Indian Ocean he was shipwrecked, reached India in obviously poor health, and died in Bombay in 1836.

When his will was probated it was found that the funds had to be kept intact for two years before the lectureships could be put into operation. At the end of this period, John Amory Lowell became the first trustee of the Lowell Institute, and the first lecture was given by Edward Everett in December, 1839. That lecture was the beginning of a long and successful group of lectures given in Boston now for 113 years. The first lecturer to deal with a scientific subject was Benjamin Silliman of Yale University who gave a series of lectures on geology in 1840. Shortly thereafter, Joseph Lovering of Harvard University gave a group of lectures on electricity and magnetism. It is interesting to reflect that it was just about this time that Samuel F. B. Morse, who had invented the electromagnetic telegraph, was engaged in putting his invention to work for mankind. The Swiss-American naturalist, Louis J. R. Agassiz came to the United States and gave many lectures on natural science. Professor Josiah P. Cooke of Harvard University delivered lectures on chemistry at a time when the elements were beginning to be arranged according to their atomic weights and before the introduction of the periodic classification by Mendelyev. It was during this period of the development of science that the public learned of progress in science from the great masters who often lectured over a period of years. This was certainly true of lecturers of the Lowell Institute, for, throughout the years, Lovering gave 160 lectures, Agassiz, 116; Silliman, 96; and Cooke, 92.

The lectures were extremely popular and admission tickets were given out at the Old Colony Book Store

at the corner of School and Washington Streets in Boston. Tickets were in such demand that, on one occasion, the windows of Old Colony were broken, and therefore new ways of distribution had to be devised. Sometimes there were as many as 10,000 applicants for a single series of lectures. The demand is not as great now, but the lectures are still held in the auditorium of the Boston Public Library, after having been given, for many years, at Huntington Hall in the old Rogers Building of M.I.T.

Of course these lectures had a direct and immediate effect on those who were fortunate enough to be able to obtain admission to them. But even more important is the way in which the Lowell lectures influenced adult education in New England and even throughout the entire country. The influence of these lectures on the formation of M.I.T. and on certain educational activities at Harvard University is especially interesting, as the following paragraphs show.

The third annual meeting of the Association of American Geologists and Naturalists was held in Boston on April 25 to 30, 1842. There came to that meeting two brothers — Henry D. Rogers, professor of geology and mineralogy at the University of Pennsylvania, and William Barton Rogers, state geologist of Virginia and professor of geology at the University of Virginia. Together they gave a paper, "On the Structure of the Appalachian Chain, as Exemplifying the Laws which have Regulated the Elevation of Great Mountain Chains Generally." William took the more difficult part of describing their geological observations, leaving to Henry the part of explaining the theory of the phenomena. They made a very favorable impression in Boston — so much so, in fact that in May, 1844, Henry Rogers was invited by John Amory Lowell to deliver a series of lectures before the Lowell Institute. This invitation was accepted with pleasure and William Rogers came from Virginia to Boston to attend his brother's lectures and to further their geological observations together in the White Mountains. It was in the White Mountains that the Rogers brothers met the family of James Savage of Boston, whose eldest daughter, Emma, became Mrs. William Barton Rogers on June 20, 1849.

In 1846, Henry Rogers moved to Boston permanently and became a candidate for the Rumford Professorship at Harvard University. In this aim he was to be disappointed, but he lectured brilliantly on geology and on physics as well, in Boston. Henry Rogers was interested in establishing a school of arts and discussed, with Mr. Lowell, the possibility of establishing such a useful enterprise as part of the Lowell Institute. It was Rogers' thought that a school of arts might eventually develop into a polytechnic institution, which the Rogers brothers had hoped, for a long time, to initiate. On March 8, 1846, Henry wrote to William asking him to come to Boston "to aid me in digesting and submitting my views on this important scheme to Mr. Lowell." In reply to this letter, William Barton Rogers formulated a plan for a polytechnic school in Boston and his proposal was brought to the attention of Mr. Lowell. Since the will of John Lowell, Jr., provided that none of the money of the Lowell trust fund be used for bricks

and mortar, a polytechnic institution (which would have to be housed and equipped) could not be established under the will. But William's outline for a technical school was not to be so easily disposed of.

In the spring of 1853, William Rogers resigned his position at the University of Virginia and came to Boston to join his brother, to lecture, and to finish his "Report on the Geological Survey of Virginia." The change from the fairly lucrative position in Virginia to the uncertainty of a new life in Boston was not made without some misgivings. But William had great plans for a polytechnic institute in Boston and diligently worked toward this end. In 1857 his brother, Henry, left Boston to become a professor at the University of Glasgow, and William was left alone in Boston to carry out his educational plan. Two years later, events took such a turn as to make possible the fulfillment of William Barton Rogers' dream of an institute of technology. The new school was to be built on the lands in the Back Bay section of Boston, bounded by Newbury, Clarendon, and Boylston Streets and the Charles River; the land for this school had been granted for educational purposes by the state legislature. Recognizing that the objectives of the school which Rogers planned were consistent with the aims of the Lowell trust, John A. Lowell, as first trustee of the Lowell Institute, was among the first to make a financial contribution toward the \$100,000 fund which the Commonwealth of Massachusetts required be established for the school. Mr. Lowell was also the first vice-president of M.I.T.

#### *Lowell Lectures and M.I.T.*

Thus it is that the unusual will of John Lowell, Jr. came to have an important bearing on the formation of M.I.T. But Lowell's influence on education did not end at this point. In fact, the Lowell lectures had a pronounced, if indirect, effect on important educational trends at Harvard University, as may be seen by recalling certain events that occurred within a few years after the Lowell lectures were founded.

In 1846, as has already been stated, Agassiz had been induced to come to the United States to deliver lectures at the Lowell Institute, and was so captivated by American audiences and their response to his work that he remained in this country. The following year he was appointed professor of zoology and geology at Harvard University when the Lawrence Scientific School was established. It is well known how the Lawrence Scientific School developed into the Engineering School and the Graduate School of Applied Science at Harvard in 1907-1908.

In 1850 and 1851 the trustee of the Lowell lectures became gravely concerned that the teaching of drawing in the United States was extremely poor, to say the least. After a trip to Europe in search of the best lecturers obtainable (as well as for new ideas in the educational field), Mr. Lowell decided to open a school of drawing. In 1851 such a school was opened in the old Marlboro Chapel in the vicinity of Bromfield Street and Winter Street in Boston. The school was the first of its kind in this country and encouraged students to do freehand sketching directly from objects themselves, rather than from paintings and

other plane reproductions. This educational innovation was not received with great favor at first, in the Boston area, but the school continued until 1879 when the chapel burned. Nevertheless, by placing emphasis on the original subject instead of upon copying, the school had a most profound effect on the teaching of drawing in this country.

Another important innovation in New England education was initiated when Mr. Lowell wrote to William Barton Rogers, President of M.I.T., as follows: "I propose to institute evening courses in instruction to be open gratuitously to the public under such regulations as may be deemed advisable." He went on to say that he felt it appropriate that the lectures should be given by M.I.T. professors and under the Institute's supervision. In 1866, when the lectures were initiated, the evening program offered 18 lectures on mathematics by John D. Runkle who later became president of Technology; 18 on descriptive geometry by William Watson, a member of the M.I.T. staff from 1865 to 1873; 18 on the chemistry of metals by Charles W. Eliot who later became president of Harvard University; 18 on the chemistry of nonmetallic elements by Frank H. Storer, Professor of General and Industrial Chemistry; 18 on English by William P. Atkinson, first Professor of English at M.I.T., and a member of its teaching staff until 1889; and 8 lectures on French by Ferdinand Bocher, first Professor of Modern Languages.

As time progressed, the evening lectures increased in number each year until about 20 subjects, with 12 lectures on each subject, were offered annually by the lecturers, all of whom were members of the Institute's teaching staff. In the school year of 1897-1898, the series of lectures was given by a group of professors well known to current M.I.T. Alumni. The group included: William Z. Ripley, '90, Arlo Bates, William L. Puffer, '84, William T. Sedgwick, Frederick H. Bailey, Allyn L. Merrill, '85, Edward F. Miller, '86, Henry P. Talbot, '85, Frederick S. Woods, Linus Faunce, Arthur A. Noyes, '86, Arthur G. Robbins, '86, Dana P. Bartlett, '86, Harry M. Goodwin, '90, Alfred E. Burton, Heinrich O. Hofman, Cecil H. Peabody, '77, Fred L. Bardwell, '84, Frank A. Laws, '89, Joseph J. Skinner, Harry E. Clifford, '86, and Frank Vogel. The subjects covered the more popular aspects of applied science of the day. These lectures continued until 1903 when they evolved into a more useful and formal kind of training.

In 1872 the Lowell School of Design was founded. Courses in the design of fabrics were given, and, when designed, the patterns could be woven on looms available to the School. This project continued for some years, until 1901, when the work was taken over by the Boston Museum of Fine Arts, at which time the trustee of the Lowell Institute became a member of the Board of Trustees of the Museum.

In 1896, A. Lawrence Lowell, son of Augustus Lowell, became a member of the Corporation of M.I.T. and upon the death of his father in 1900 became the trustee of the Lowell Institute. Accordingly, he had an excellent opportunity to determine how well the lectures were being received in metropolitan Boston and he soon came to one very definite conclusion: The lectures on popular subjects were



very well done and were doing much good, but they were not reaching the class of people who most needed help. There was ample opportunity for people with money to go to college. For the tradesman there were trade schools where he could improve himself in the techniques of his craft. But there was no opportunity for the foreman, or the man who aspired to become a foreman, to improve himself in his daily work. Dr. Lowell felt that it would be better to replace these supplementary lectures, on more or less unrelated topics, by lectures organized into a well-planned curriculum. In so doing, he felt it would be possible to persuade the shop foreman to return to school.

With this idea in mind, Dr. Lowell presented his plan to Henry S. Pritchett, recently inaugurated president of M.I.T., and found a sympathetic listener. President Pritchett appointed Professor Charles F. Park, '92, to draw up plans which would enable men working in industry to take evening instruction in subjects that would best fit them for their daily work. As drawn up, the plan called for students to go to school two hours a night, three or possibly four evenings a week, to receive instruction, with lectures, recitations, drafting exercises, and laboratory work in industrial topics. Courses of instruction would be co-ordinated into a two-year program at the end of which the men would receive a certificate stating that they had satisfactorily completed either the electrical or the mechanical course. The plan of Professor Park met with immediate approval by Dr. Lowell who requested President Pritchett to appoint Professor Park as director of the new Lowell School for Industrial Foremen. This was agreed, and final approval for the school was given late in the summer of 1903. Notice of the school about to be opened was announced in the newspapers. That was the beginning of the Lowell School for Industrial Foremen, or the Lowell Institute School as we know it today.

The first night the school opened, 165 men attended to hear Professor Park describe the school in detail and how it would be operated and to learn that classes would begin the following Wednesday. Of the 97 men who appeared the second night in 1903, the first-year course was completed by 60, and 55 were admitted to second-year studies. The following fall, 50 registered and 30 men graduated, of whom 15 had taken the mechanical course and 15 the electrical course. That was the Class of 1905—the first one of the Lowell Institute School. From that time on, there was a slow and steady growth in registration until the beginning of World War I. During the war, registration dropped, of course, but during the twenties and thirties, enrollment increased until 640 men were admitted to first-year instruction in 1939.

Throughout the years, the curriculum has changed substantially, increasing in content and intensity and adopting increasingly high standards for admission. At first, arithmetic, elementary algebra, plane geometry, and simple mechanical drawing were the entrance requirements. But now it is necessary to include algebra through quadratics, and trigonometry as requirements for admission. The present curriculum starts by giving analytical geometry and physics during the first 10 weeks. Calculus, mechanism and

heat are studied during the second 10 weeks, and mechanisms, statics, and mechanism design complete the work of the first year. A student can then decide which of the professional courses he wishes to follow in the second year. To the mechanical and electrical courses which have been in operation since 1903, the buildings course was added in 1913.

In the second year, the mechanical course offers subjects which would normally be given in the third and fourth year of a curriculum in mechanical engineering. Strength of materials, thermodynamics, steam power, hydraulics, machine design, and conventional laboratory courses are offered. The work in the electrical course is of similar intensity and content. The second-year building course comprises structural mechanics, electrical equipment of buildings, materials of construction, building construction, reinforced concrete design, and structural design.

Over the years the Lowell Institute School has issued about 4,400 certificates to 4,000 of its graduates. After completing one two-year course, some students return to complete a second course in one additional year; a few even come back for a third course.

In 1923 the school was asked to provide supplementary or advanced courses in particular fields. It was the intent of the supplementary courses to provide advanced training in specialized subjects for men working in industry. About 3,000 supplementary certificates have been issued since 1923 to 1,700 students. During the depression, men have been known to take as many as five supplementary courses a year and as many as 14 courses in three years.

Students in the Lowell Institute School come from large corporations in metropolitan Boston, from engineering offices, and from small machine shops and manufacturing plants. About half the students come from companies employing from five to 100 persons. Occupationally they may be machinists, stock clerks, production clerks, cost clerks, carpenters, laborers, steel fitters, telephone installers, telephone repair men, inspectors, checkers for drafting offices, assembly draftsmen, or designers.

Especially in these inflationary times, Lowell Institute School students obtain useful training at a ridiculously low cost to themselves. Beside purchasing their books they pay only a \$5.00 registration fee, equivalent to the cost of two bushels of ripe wheat. This covers a portion of the necessary secretarial and clerical work, mimeographing, mailing, and so on.

Throughout the years, the teaching staff has averaged about 19 men of professorial rank and from 15 to 25 men of instructor rating. All Lowell School instructors teach at M.I.T. or are graduates of M.I.T. or the Lowell School. As far as instruction goes, it is the best obtainable. Some instructors have taught in the Lowell Institute School for 35 or 40 years.

The students have a most refreshing and wholesome philosophy of life. They give up a good deal of their time to acquire an education the hard way, but they know full well that training for their daytime work will pay dividends in the long run.

One of the interesting features of the Lowell Institute is that each trustee has initiated some new idea in the field of adult education. Of course it was

*(Concluded on page 114)*



Richard Finnie for Bechtel International Corporation

# American Technology in Arabian Oil Lands

By RICHARD FINNIE

**A**n oft-told tale among Americans in Saudi Arabia is about the Bedouin laborers, fresh from the desert, who were instructed to move some concrete in a wheelbarrow from a mixer to a building site. They filled the wheelbarrow, then clustered around, hoisted it to their shoulders, and carried it away.

The story is not farfetched considering that, to some of the desert tribesmen, a construction tool as basic as a hand shovel was a curiosity until recently. Even today there are thousands of Bedouins whose dress and customs have barely changed in a thousand years.

Extraordinary, therefore, is the fact that many of these people are now driving trucks and tractors, operating complicated machinery of various sorts, and qualifying as mechanics, technicians, clerks, and bookkeepers. Moreover, most of them are employed through local contractors who themselves were blissfully ignorant of modern technology not long ago. So far as their material wants are concerned, the lives of these ancient people have been greatly enriched in the transition from nomadic to a technological way of living. All of this has come about through an intensive long-range training program.

Before sketching the history of these developments, perhaps some of the conspicuous differences between the inhabitants of the several Arab countries should be noted.

The Arabs of the towns are unlike the Arabs of the desert; the Arabs of Syria, Lebanon, Jordan, and Iraq are different in a number of ways from one another; and those of the Arabian Peninsula are distinct from the rest, although all speak Arabic, and Islam is the prevalent faith. The Arab countries bordering the Mediterranean began to collect the trappings of Western civilization long ago, but until very recently,

Saudi Arabia and neighboring shaikhdoms of the peninsula maintained a culture practically unchanged since the Seventh Century.

A fundamental reason why time stood still in Arabia was that it was poor in known natural resources and had little to attract foreign commerce. Saudi Arabia imported 70 per cent of its foodstuffs and had virtually nothing to export. The principal source of revenue was the Haj—the pilgrimage to Mecca—which annually attracted about 100,000 Moslems from Eastern lands.

Early in the present century, Abdul Aziz al Rahman al Saud, the scion of a princely family, began an extraordinary rise to power. By 1924, when he drove the Sharif of Mecca into exile, he had become the undisputed lord of Arabia, unifying it for the first time in its long history. About the same time as ibn-Saud assumed his ruler's mantle, British geologists discovered oil in Persia, now Iran. This led to investigations through the Persian Gulf area culminating, some years after, in the tapping of one of the world's richest oil reserves in ibn-Saud's domain.

It was in 1932 that American interests struck oil on Bahrein Island. This island became an important but not a phenomenal oil field, and attracted attention to the Saudi Arabian mainland, only 25 miles away. A turning point in the history of Saudi Arabia came about in 1938 when the first commercially significant





well was brought in at Dammam. Five years earlier, in 1933, believing in the integrity of the American businessmen who approached him, ibn-Saud had granted a concession to the Arabian American Oil Company for the exclusive petroleum exploration and development of an area of 440,000 square miles — almost half of his kingdom. Aramco, as the concessionaire company became known for short, was organized by the Standard Oil Company of California. The Texas Company came in with a 50 per cent interest in 1936, and eventually Aramco became a partnership of Standard Oil Company of California (30 per cent), the Texas Company (30 per cent), Standard Oil Company of New Jersey (30 per cent), and Socony-Vacuum Oil Company (10 per cent).

Hand in hand with the development of oil, Aramco assumed the responsibility for the development of local man power. From the very first, it was Aramco's policy to employ and train as many Arabs as possible. From a tiny nucleus of Americans and Saudi Arabs who pioneered the development program 17 years ago, the number of workers has grown to 17,000, of whom 60 per cent are Arabs. During 1950, more than 4,000 merit increases and an almost equal number of promotions were given to employees. More than 2,200 Saudi Arabs have been with the company without a break for five years. By the summer of 1951, they had built up petroleum production to an average of more than 600,000 barrels per day. Aramco and Saudi Arabia together have prospered.

At the same time, large-scale public works — railroads, electrification, water supplies, ports, educational and public-health programs — have been conducted on a partnership basis. As a matter of fact, in bringing industry to an undeveloped country, Aramco's operations anticipated President Truman's Point Four policy by a number of years. It has taught the nationals of that country new trades and new ways of supporting themselves. The introduction of

Twentieth-Century technology into Seventh-Century Saudi Arabia rivals the magic of the tales of *The Arabian Nights*. Although the need for oil on the part of those countries with well-developed technologies was, of course, the primary incentive for developing the region of the Arabian Peninsula, many of the co-operative undertakings have had nothing directly to do with oil. For example, as the result of Aramco-fostered agricultural experimentation with seed, fertilizers, and irrigation over a five-year period, Arabs have grown 14 crops annually on land that formerly yielded only a few dates and scrubgrass.

In most cases, the training of Saudi Arabs had to be started from the most elementary beginnings. Beside being untutored in modern technical knowledge, they were, in the main, illiterate. Government schools were few and their teachings were almost exclusively religious. Aramco provided elementary courses in reading, writing, and arithmetic, then went on with technical training. The latter was continued from the classroom to the field, where on-the-job instruction became standard practice. American employees are given special schooling, too, in a training center where recruits spend six weeks studying Arabic history, religion, customs, and language.

In 1943 an American firm, International Bechtel, Inc., was called upon to build refinery facilities for the Bahrain Petroleum Company, which was jointly owned by Standard Oil Company of California and the Texas Company. Large numbers of Bahrainis, most of whom had been dependent on a dwindling pearl-fishing industry, found employment in the expanding refinery. On-the-job as well as classroom training was conducted, and today the Bahrainis are much better off than ever before.

In 1944 the Bechtel interests began the erection of a modern refinery at Ras Tanura, the oil-shipping terminal 50 miles north of Dhahran. In addition to the

*(Continued on page 116)*

*(Left): Arabs are employed as technicians in a photographic laboratory in Dhahran. (Right): Saudi Arabs, trained by American electricians, string the first municipal power line in the capital city of Riyadh.*

Richard Finnie for Bechtel International Corporation



# THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

## Strategy for Uncertainty

### ***President Killian Reports How M.I.T. Refines Its Normal Educational Program as It Contributes to Research for Defense.***

IN his annual report to members of the M.I.T. Corporation on October 1, James R. Killian, Jr., '26, President, surveyed results of the "strategy for uncertainty" which has guided the Institute's activities for the past year. Although the primary function of M.I.T. is to provide outstanding training in science, engineering, architecture, and management, the Administration also recognizes fully the special responsibilities it is called upon to assume in furthering this nation's national defense program under present disturbed world-wide conditions. At the urgent request of the United States Government, the Institute undertook the heavy responsibility of added defense research. But it was able to conduct this research while maintaining, refining, and expanding its educational program and other normal activities. In reporting on the expansion of the Institute's facilities since his last report, President Killian said:

During this past year we established a School of Industrial Management and changed the Division of Humanities into a School of Humanities and Social Studies. Recommendations of the Committee on Educational Survey were implemented further by a reorganization of the Faculty's committee structure to provide better planning and supervision of the undergraduate program, and by the approval of a revised and extended program of general education. Several professional courses completed important curriculum revisions, and further progress was made in extending the scope and variety of our Summer Session. A new dormitory, Burton House, was brought into operation — a conclusive step in making M.I.T. a residential college. The Hydrodynamics Laboratory and Towing Tank was completed and dedicated. Under construction are the Metals Processing Laboratory and the John Thompson Dorrance Laboratory for Biology and Food Technology. And finally, we successfully completed a \$20,000,000 fund campaign. . . .

**School of Industrial Management.** As conceived by Alfred P. Sloan, Jr., '95, whose generosity and loyalty to M.I.T. made the new school possible, the School of Industrial Management will seek to correlate the complex problems of management in modern technical industry with science, engineering, and research. Said Dr. Killian:

Research is to be emphasized in the School's program, not only for the purpose of making creative contributions in this field, but also to insure that the teaching in the

School does not become routine and outdated. For such research activities, M.I.T. seems uniquely prepared to make an outstanding contribution. The cross-fertilization which will here be possible between science, engineering, the social sciences, and men thinking in terms of management, will provide exceptional opportunity for pioneering and creative contribution to management science. The School will also seek to evolve special methods for maintaining close contacts with industry.

Two important steps have been taken toward the establishment of the School of Industrial Management. The first was the purchase of Lever House as the home of the School. This fine building, at 50 Memorial Drive, stands on a plot of land adjoining the Institute's grounds. It is now being remodeled to provide the most ideal possible quarters. We expect to occupy the building by the beginning of the second term. The Department of Business and Engineering Administration, which will be a component of the School, will be housed in this building, together with the Department of Economics and Social Science. The building, which has been named the Alfred P. Sloan Building, will also provide on its sixth floor ample quarters for a long-needed Faculty Club which will serve the entire Institute as well as the School of Industrial Management.

The second step was the appointment of E. P. Brooks, '17, Vice-president and Director of Sears, Roebuck and Company, as Dean of the School. . . . We hope that the school may be formally opened by the fall of 1952.

**Undergraduate Education.** Substantial progress has been made during the year in improving instruction in undergraduate courses in accordance with the general objectives outlined in the *Report of the Committee on Educational Survey*, and implemented by the Committee on Undergraduate Policy. Speaking of the work of this Faculty committee at M.I.T., President Killian reported:

Effective supervision of the undergraduate curriculum as a whole, its objectives, its standards, and its philosophy of education, has been made the concern of a Faculty Committee on Undergraduate Policy, as recommended by the Educational Survey Report. Under the chairmanship of Professor Walter G. Whitman, '17, on leave of absence from the Department of Chemical Engineering, this committee has proceeded skillfully to carry out its assignment. During its first year it has paid particular attention to problems of the freshman year. Innovations initiated by the committee include the designation of a Faculty adviser for each section of freshman students. This has led to a closer student-Faculty relationship than before, and the freshmen have responded by inviting the advisers to meet with them at various times. The committee also sponsored orientation lectures for freshmen early in the fall term and a review period at the end of each term of the freshman year when no classes were

(President's report continued on page 100)



## Financially Speaking

**I**N the annual report of the treasurer, presented to the Corporation of M.I.T. on October 1 and summarized here, Joseph J. Snyder, 2-44, stated that the year 1950-1951 was a period of increasing activity—the total volume of operations reaching \$23,469,000 compared with \$21,470,000 last year. The greater part of the expansion was in revenues from research contracts which increased from the 1949-1950 figure of \$12,858,000 to \$15,020,000. Tuition income declined but this reduction in revenues was largely offset by higher income from investments and income from gifts and other receipts used for current expenses. Total salaries and wages were \$14,875,000 for the year and made up 63 per cent of all expenses.

The invested and other funds of the Institute were \$56,817,000 on June 30, 1951, and \$52,682,000 on June 30, 1950. The net increase of \$4,135,000 in funds during the year consisted of \$1,660,000 in endowment funds, \$1,448,000 in building funds, and \$1,027,000 in other classes of funds. The major addition to the endowment was the Faculty Salary Fund of \$1,000,000 established from other invested resources, to fund a part of the cost of the increase in staff salaries made in the spring of 1951.

Over the last 10 years the invested and other funds have increased \$20,213,000. More than two-thirds of the new resources have been in funds for current expenditure, and these funds for the most part have been temporarily invested with the endowment funds.

On June 30, 1951, the endowment funds amounted to \$38,787,000 and 68 per cent of all invested and other funds, as compared to 90 per cent of all invested and other funds 10 years ago.

At the close of the fiscal year the book value of the plant of the Institute was \$28,577,539 and construction in progress, when completed, will bring the value of the educational plant to well over \$30,000,000. Added to the facilities for education and research, in the five years ended June 30, 1951, was \$11,267,000—equivalent to almost 40 per cent of the present plant.

The principal addition to plant in 1950-1951 was the Sloan Building, purchased from the Lever Brothers Company. Construction under way on the John Thompson Dorrance Laboratory and the Metals Processing Laboratory, together with other buildings, resulted in a total increase in plant of \$4,364,000 during the 12 months under review.

If the revenues for reimbursement of direct research contract expenses are excluded from total revenues, the traditional sources of income—tuition and investment income—make up but half of the total operating income of the Institute. Gifts for immediate use, industrial grants and other sources of current income are now of major importance in financing the program in education and research from year to year. This fundamental change in the sources of support for current operations underscores the need constantly to build the endowment and other funds of the Institute so as to meet the forces of inflation and to stabilize the greater scale of operations brought about by the widened responsibilities of M.I.T. The increase of the endowment funds is the next step in the Institute's

long-range development plan now that many, but not all, of its building requirements have been financed.

The proportion of the General Investments at market in common stocks at the end of the fiscal year has been steadily rising for five years. Common stocks have increased from 33.7 per cent on June 30, 1946, to 45.9 per cent on June 30, 1951. During these years real estate increased from 7.6 per cent to 17.2 per cent with the greater part of the increase in buildings for Institute use. Over the same interval bonds have declined from 50.8 per cent to 27.9 per cent.

The renovation of Burton House brought the total investment of the Institute's endowment and other funds in dormitories and housing projects to \$4,875,000 and 8.1 per cent of General Investments. The sum of \$109,000 was provided from dormitory and other operating income for investment amortization, bringing the reserve set aside largely for this purpose to \$189,000 at the year end.

Dividend income on common stocks has increased sharply in recent years, from 43.2 per cent of all income on General Investments in 1946-1947 to 63.6 per cent in 1949-1950 and further to 65.5 per cent in 1950-1951. With the greater investment in stocks, and the higher dividend income, the rate earned for the funds sharing in the income from the General Investments increased from 3.98 per cent in 1949-1950 to 5.02 per cent in 1950-1951 on the average book value of the funds.

In the past decade, the scale of operations has increased fourfold, and plant and building funds together have nearly doubled. In this 10-year period total invested funds have increased 50 per cent and the endowment funds 18 per cent. As the size of the student body has grown from 3,100 to over 5,000 the endowment per student has dropped to \$7,500 from \$10,800 in 1941. If both endowment funds and funds available directly for support of current operations can be augmented, the position of the Institute will be strengthened and its capacity to produce educational and research services will be unimpaired in the years ahead.

## Of Many Things

**A** FULL and active program of business greeted members of the Alumni Council when the 284th meeting of this body opened the new season under the chairmanship of Alfred T. Glassett, Jr., '20, President of the Alumni Association for the current year. In attendance at the Campus Room of the Graduate House for the dinner meeting on October 29 were 143 members and guests, to make this the largest Alumni Council meeting on record.

A resolution on the late Edward L. Moreland, '07, Dean of Engineering at M.I.T., offered by Raymond Stevens, '17, for the Committee on Resolutions, was adopted by a silent rising vote. Six changes in class affiliation were approved, and Donald P. Severance, '38, Secretary, reported that 17 members of the Institute's Administration, Faculty, and Alumni Council had visited M.I.T. clubs in Tokyo, London, Paris, Brussels, Toronto, and Montreal, as well as 25 clubs in the United States, between June 26 and October

29. The Alumni Day Committee reported a loss of \$1,887 for the activities of June 11, 1951, compared to a budgeted loss of \$2,500.

The publisher of *The Review* reported an exceptionally fine year for Volume 53 with a net return to the Alumni Association of \$12,920 — the second highest in *The Review's* history. The Treasurer's Report showed that a total of \$16,034 is being turned over to the Alumni Fund, of which \$1,378 is the unexpended balance of the 1950-1951 budget, and the remainder is from operations of Volumes 52 and 53 of *The Review*.

The 1952 Midwinter Meeting of Alumni in Metropolitan Boston will be held on Thursday, January 31, 1952. William W. Garth, Jr., '36, will serve as chairman and Royal Barry Wills, '18, as cochairman. William H. Carlisle, Jr., '28, Russell Hastings, Jr., '34, and William R. Saylor, '36, are other members of the Midwinter Meeting Committee. Next year's Alumni Day will be held on Monday, June 9, 1952, at the Hotel Statler in Boston. George Warren Smith, '26, has been named chairman and George W. McCreery, '19, co-chairman.

President Glassett then turned the meeting over to John A. Lunn, '17, who, as President of the Alumni Association for 1950-1951, presented a certificate of honorary membership in the Alumni Council to Marshall B. Dalton, '15. Mr. Dalton accepted the membership not so much for any personal contributions which he made to the Development Fund but in recognition of the contributions which have been made by the several thousand who have devoted time and energies to this campaign. As the last item of business of the meeting, before hearing the scheduled addresses, President Glassett presented to Mr. Lunn a silver and ebony gavel as a memento of his term of office as the 57th president of the Alumni Association.

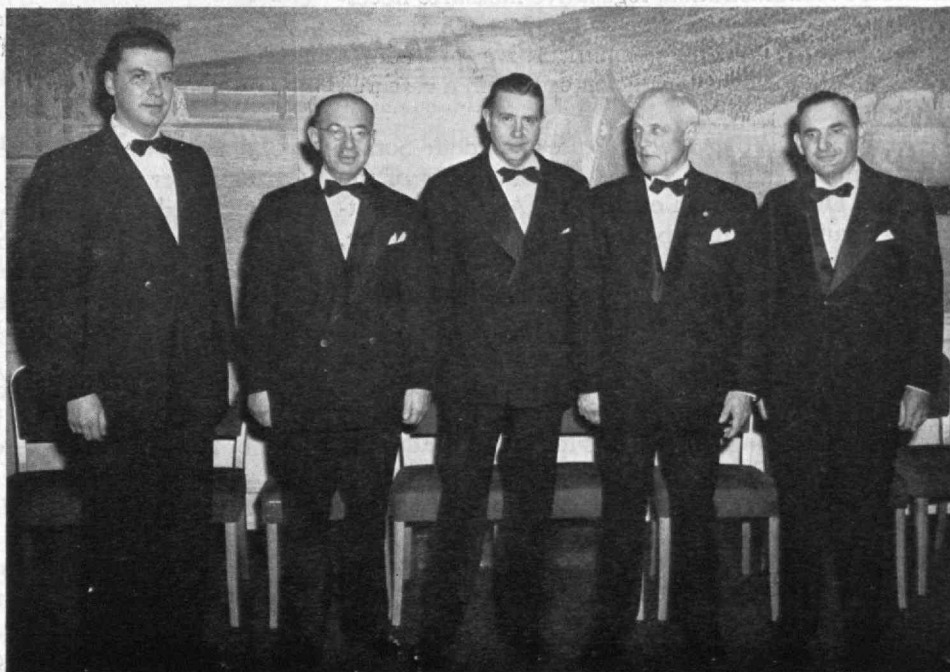
Mr. Glassett next called on President Killian to acquaint the Council members with significant Institute developments since the last gathering on Alumni Day. Dr. Killian spoke of his visit, last summer, to

Europe where he visited a number of M.I.T. clubs. He also reported that he had had an enjoyable visit in England with the Institute's Honorary Lecturer who has since become Prime Minister of Great Britain — Winston Churchill. President Killian mentioned the gift of the Boston Stein Club (described in the photo caption below) and spoke in glowing terms of the student conference on leadership held this fall at Swampscott, which had been made possible by a gift from Vannevar Bush, '16.

Turning to the acute shortage of engineering and scientific personnel, President Killian stressed the point that the Institute's major concern was with the quality, rather than the quantity, of students it turned out, and outlined three programs now in progress directed toward achieving this aim. One of these is the formation of a group of educational advisers, as outlined on page 487 of the July, 1951, issue of *The Review*, in which appointed Alumni will assist the Admissions Office in selecting outstanding students for entrance to the Institute. Another is the recently initiated program for studying the progress of freshmen in their college work, and correlating a student's motivation with his background. Finally, the Office of the Dean of Students has aimed to obtain more complete background information from parents and headmasters, after students have been admitted to the Institute. It is hoped that such an experiment will assist in improving the personal relations between students and Faculty members and provide for better understanding of the students' problems. President Killian read extracts from several letters, which had been received from parents and principals of preparatory schools, indicating that the wholehearted and candid replies had been written with the aim of being of greatest aid to the incoming students.

Final speaker of the evening was Joseph J. Snyder, 2-44, the Institute's Treasurer, who reviewed the status of M.I.T. finances. Matters reported on by Mr. Snyder, especially those of a statistical nature, are summarized on page 92.

*At the dinner of the Boston Stein Club, held at the Hotel Statler in Boston on October 17, the club presented the Institute with a fund of \$41,000 to be known as the Karl Taylor Compton Prize Fund. The income of the fund is to be used for prizes for students of unusual qualifications. Guests and hosts at the dinner were (left to right): Stanley W. Warshaw, 2-44; Alexander Brin, editor of the Jewish Advocate; James R. Killian, Jr., '26, President of M.I.T.; Karl T. Compton, chairman of the Corporation; and Oscar H. Horovitz, '22, President of the Stein Club, who presented the gift to Dr. Compton.*





## Regional Seminar in California

UNDER the auspices of the M.I.T. Club of Southern California, their first Midwinter Regional Seminar is scheduled to be held on Saturday, January 26, 1952, at the Elks Club in Los Angeles. Members of the Institute's Faculty and Administration will outline recent progress in science and engineering at the conference — the theme of which will be new frontiers of science.

Those who will travel from Cambridge to Los Angeles to speak at this new type of conference include: President Killian; Professor Thomas K. Sherwood, '24, Dean of Engineering; Professor Charles S. Draper, '26, Head of the Department of Aeronautical Engineering; Richard H. Bolt, Associate Professor of Physics and Director of the Acoustics Laboratory; and John G. Trump, '33, Associate Professor of Electrical Engineering and Director of the High Voltage Research Laboratory.

Details of the program for the Midwinter Regional Seminar are being developed by George M. Cunningham, '27, Second Vice-president of the Club, and Program Chairman, to whom requests should be addressed for additional information.

## Japanese Educators Visit M.I.T.

As part of their three-months' tour of leading universities, research laboratories, state legislative assemblies, and government agencies, a delegation of leaders in Japanese education and government administration visited the Institute on October 18 and 19.

The purpose of the mission was to afford a group of Japanese national leaders an opportunity to observe and study the methods in use in the United States to provide universities and research institutions with funds needed to promote education and research in fields of science and technology. During their visit in Cambridge, the group discussed, with members of the Institute's Administration, legislative measures necessary to provide for education and research, budgeting problems involved, and administrative procedures within an educational institution or within a research laboratory.

The group visiting the Institute included: Sotaro Takase, member of the House of Councillors of the Japanese Diet, chairman of Political Affairs Committee, Ryokufu-Kai, member of Budget Committee, member of International Trade and Industry Committee, formerly President, Tokyo University of Commerce, Minister of Education, Minister of International Trade and Industry; Masao Maeda, member of House of Representatives of the Japanese Diet, member of Standing Committee for Transportation, member of Standing Committees for Mining Industry, Transportation, Economic Stabilization, and International Trade and Industry; Tominosuke Katsurai, Chief of the Abstracting Section, National Diet Library, formerly Fellow of the Institute Physical Chemistry Research, Adviser in the Scientific Technical Division, General Headquarters, Supreme Commander Allied Powers.

## Buck Rogers at M.I.T.

IT will probably come as something of a surprise for Technology Alumni to learn that ordinary mortals feel uncomfortable at M.I.T. Such, however, is one of the conclusions reached by Robert M. Yoder whose article in the *Saturday Evening Post* for October 20, 1951, is entitled "Buck Rogers Would Love It Here."

Here at the Institute the refreshing opportunity to view ourselves through the eyes of a welcome visitor was received as an antidote to myopia. To friends and Alumni of the Institute, we recommend Mr. Yoder's article as a means of counteracting such threadbare misconceptions as that the Institute: (1) has no athletic program; (2) has no undergraduate school; (3) has a student body made up entirely of "brown baggers" and "grinds"; or that it (4) deserves the popular slogan shown in the illustration on page 33 of the *Saturday Evening Post*.

## Paintings Added to Art Collection

A UNIQUE and distinguished collection of 26 drawings and paintings was formally presented to the Institute on October 1 by the Standard Oil Company of New Jersey. The collection, selected from a group commissioned by the company to document the scope of the oil industry, was presented by David A. Shepard, '26, executive assistant to the president of that company. Dr. Killian, M.I.T.'s President, accepted the collection for the Institute.

In accepting the paintings, President Killian said that he especially welcomed them as the first large addition to the Institute's recently established permanent art collection. The permanent art collection at M.I.T. has been established as part of the Institute's program to broaden the scope of educational opportunities in the humanities for engineering students.

Standard Oil Company of New Jersey began its collection in 1944 when 16 well-known American artists recorded the job oil was doing to help win World War II. The company also felt that its sponsorship of the arts would help emphasize the growing recognition that the humanities must play an equal part with the sciences if Twentieth-Century man is to achieve his fullest promise.

## Fulbright Scholarships

FULBRIGHT scholarships for foreign study have been awarded to two students at the Institute: Eugene S. Rubin, 6-45, of Waltham, will study aeronautical engineering at the Imperial College of Science and Technology of the University of London; Robert N. Noyce, G., of Sandwich, Ill., will study physics at the University of Paris.

These grants bring to eight the total Fulbright scholarships which have been awarded to M.I.T. students for the academic year 1951-1952. Those who were awarded Fulbright scholarships for 1950-1951 were mentioned in the November, 1950, issue of *The Review*.

The award is made by the Department of State under the provisions of the Fulbright Act. It is one of approximately 750 grants, including 100 state scholar-

(Continued on page 96)

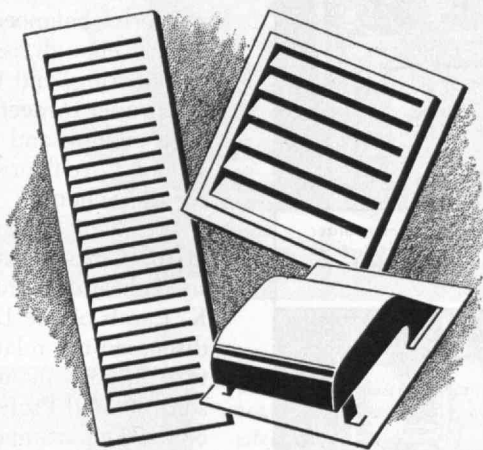
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This case is cited not merely because it illustrates a fine way to get orders. What is really important about it is the evidence it provides of the value of team work. In Revere, the team works this way: a capable salesman calls on a prospect, and asks for the opportunity to do more than solicit an order. The Technical Advisory staff, if permitted, applies its knowledge, skill and ingenuity in overcoming problems and setting up specifications in collaboration with the prospect. Once an order is received, the

capable mill employees, including methods and production departments, set up proper mill and shipping procedures, and carry through the order with careful efficiency. Team work of this kind has contributed mightily to create Revere's outstanding position. However, it should not be overlooked that in this description of the team, the customer is included. He very definitely belongs. You might say he is the catcher, plus an infielder or two and a couple

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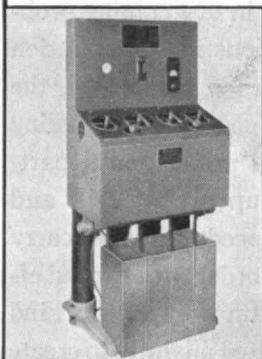
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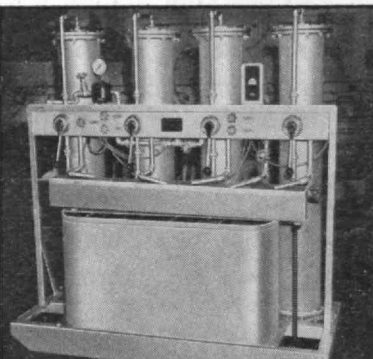


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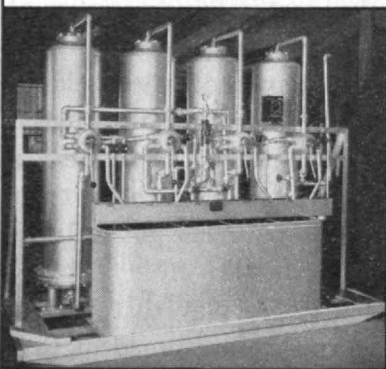
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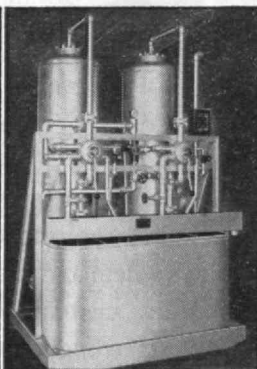
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## THE INSTITUTE GAZETTE

(Continued from page 94)

ships, for study abroad which are a part of the Fulbright program for the academic year 1951-1952. As provided by the act, all students are selected by the Board of Foreign Scholarships, the members of which are appointed by the President. Students are recommended by the campus Fulbright committees and by the Institute of International Education.

Funds used in the Fulbright program are foreign currencies realized through surplus property sales abroad. Under executive agreements with the foreign governments, programs are currently in effect with 19 countries.

### Architecture and Planning

AMONG other subjects discussed by members of the Visiting Committee on the School of Architecture and Planning\* at its meeting last spring, on April 17, 1951, consideration was given to the following questions: Has the School enough, but not too many, properly selected students? Are teaching and research properly balanced by the Faculty? Is the School closely enough associated with mechanical and civil engineering, and the social sciences? Has the School the proper respect for aesthetic values? Are standards high enough and pace-setting enough to assist other schools? Are floor space and library facilities adequate for the School?

President Killian and Karl T. Compton, chairman of the Corporation, attended some of the discussion sessions and the luncheon, at which Professor Robert K. Lamb of the Department of English and History discussed the relation of urban sociology to architecture and city planning. Professor Lawrence B. Anderson, '30, and Professor Frederick J. Adams, in charge of the Departments of Architecture and of City and Regional Planning, respectively, assisted Pietro Beluschchi, Dean of Architecture and Planning, in presenting the problems of the School.

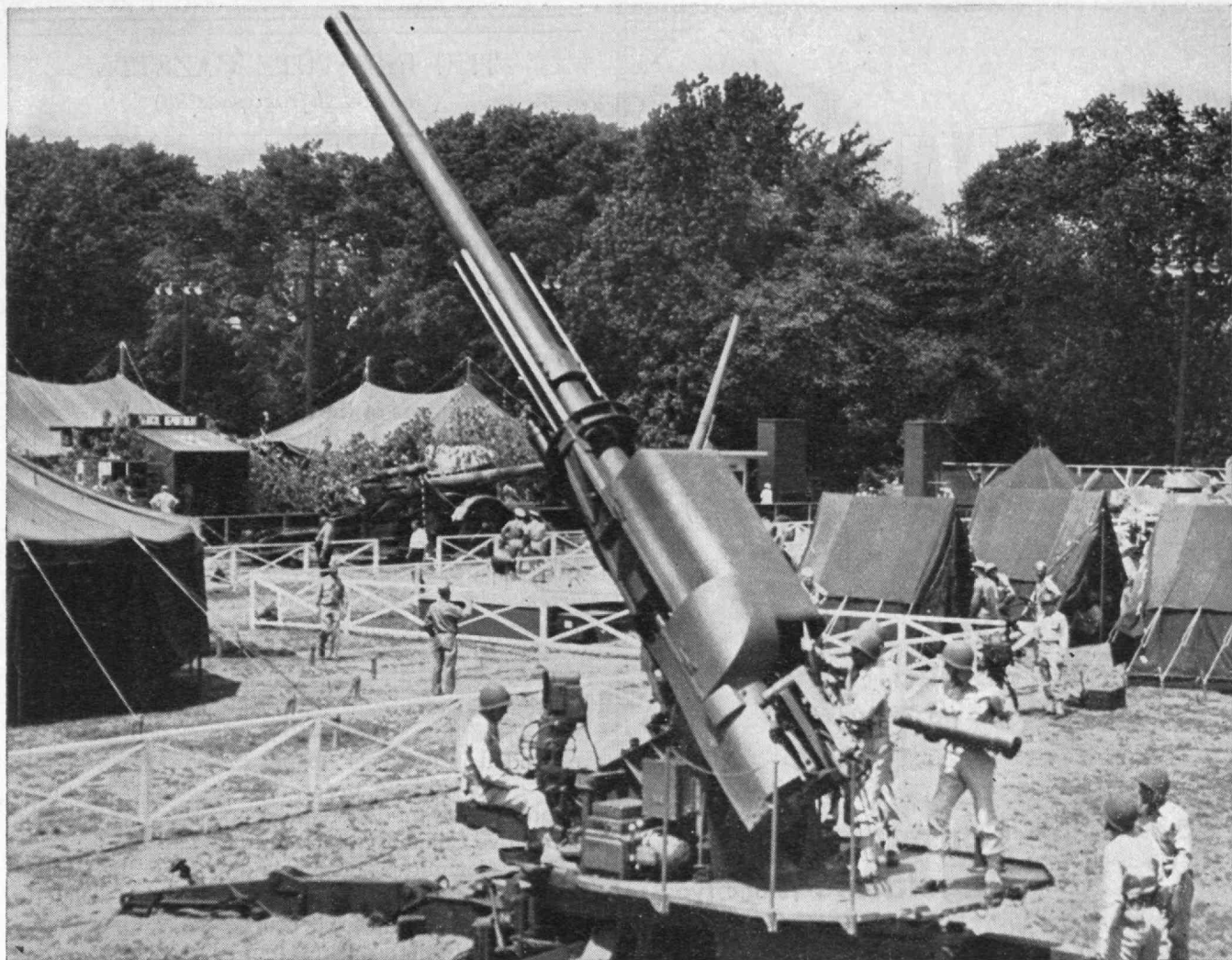
Specific points considered by the Committee at this meeting are enumerated in the following paragraphs.

The decision on the transfer of the School to the new Sloan Building rests with the executive officers of the Institute and of the School, but the prevailing sentiment of the Committee seemed to favor remaining in the present quarters, as they are sufficient to accommodate an enrollment such as now exists. Also it was the general feeling that larger enrollments are undesirable, except possibly in City and Regional Planning.

The staff of the School was asked to consider the advisability of making two important changes in the curriculum: the first would provide that the Course requirements be identical for Planning and for Architecture in the first year in the School (second year in the Institute); and the second change that was

(Concluded on page 98)

\* Members of this Committee for 1950-1951 are: Harlow Shapley, chairman, Harry J. Carlson, '92, John L. Reid, '31, Henry Cohen, 2-44, Max Abramovitz, William Emerson, and Douglas Haskell.



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## THE INSTITUTE GAZETTE

(Concluded from page 96)

suggested would provide that Planning, like Architecture, be a five-year Course, with the possibility of awarding both the B.S. and M.S. degrees at the end of the fifth year. With such an arrangement some special summer activities would be required.

The Planning Department does not at present have any major research project under way, but one or more attractive possibilities are in sight. The time of the staff is currently absorbed in teaching.

Three members of the staff of the School of Architecture will be absent during 1951-1952: one will be on a sabbatical leave, one on a Guggenheim fellowship, and one as a Fulbright scholar. Replacements for these absentees will be arranged.

About 20 per cent of the graduate students come from countries other than the United States — a percentage higher than the average for the Institute. No change is recommended.

The School's library is important, of course. It is well supplied with older publications, but a complete overhauling of library materials has become necessary. According to Dean Belluschi \$3,000 should be expended in one year, to put the library effectively into good working order. The Visiting Committee approved this modest request and referred it to the Executive Committee for consideration.

The Committee recommended that the School consider setting up a special summer short course to serve the professions in specialized fields, for example, in architectural acoustics, public school planning, and so on. Such courses, each of a few weeks' duration, would be largely self-supporting. The Committee also endorsed the tentative plan to have one or more special two-day seminars during the school year — conferences similar to the one which was held during 1950 on solar heating for houses.

The proposal for an Institute of Urban Studies, involving many departments in M.I.T., was favorably discussed by Dean Belluschi and his associates. If such an institute is undertaken, certainly the School of Architecture and Planning would be involved. The project of courses in urban sociology, in association with Professor Lamb, might be developed directly within such an Institute of Urban Studies.

The relation of the fine arts to architecture should be explored at this time in view of the new developments in the humanities.

The responsibility of the School in finding positions for its graduates — either summer jobs or postgraduate positions — was sympathetically discussed but no firm policy was adopted. The graduates do obtain jobs; personal and informal advice on summer work seems to be sufficient. It was the feeling of the Committee that the Department's employment service should not be obligatory. Many architects cannot afford to employ summertime workers, if the students aspire to be more than coolies. The Committee and the Departments agreed that the students in Architecture and in Planning should be encouraged to go abroad in the interests of wider experience.



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## PRESIDENT'S REPORT

(Continued from page 91)

scheduled for the last week before term-end examinations. On its recommendation, the Faculty has appointed a special committee charged with the responsibility of devoting itself intensively to the curriculum of the first two years, which is basic to all courses.

One of the major assignments of the Committee on Undergraduate Policy was to study the Faculty's committee structure with a view to proposing changes which would increase the effective participation by Faculty members in the formulation of educational policies. Proposals of the committee were discussed, modified, and approved by the Faculty at its March meeting, and a new committee structure is now in effect. In addition to the special committee already mentioned, other important new Faculty committees include those on Student Aid and on Student Environment. To implement this new Committee on Student Aid, the Executive Committee has established a new administrative post, Director of Student Aid. Thomas P. Pitre, Dean of Freshmen, has been appointed to this post, and he will serve as chairman of the committee. Under policies established by the committee, he will have the responsibility of co-ordinating all forms of undergraduate student aid — loans, scholarships, and employment.

**Curriculum Changes.** Changes of curricula and teaching methods in the various departments are continually taking place. The spirit of these changes is the same throughout the Institute: to increase the flexibility of the program, to respond to new professional demands, to enlarge the opportunity for creative achievement in the un-

(Continued on page 102)

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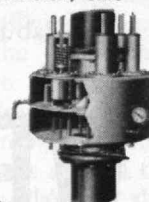
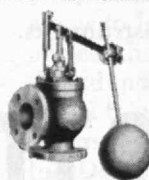
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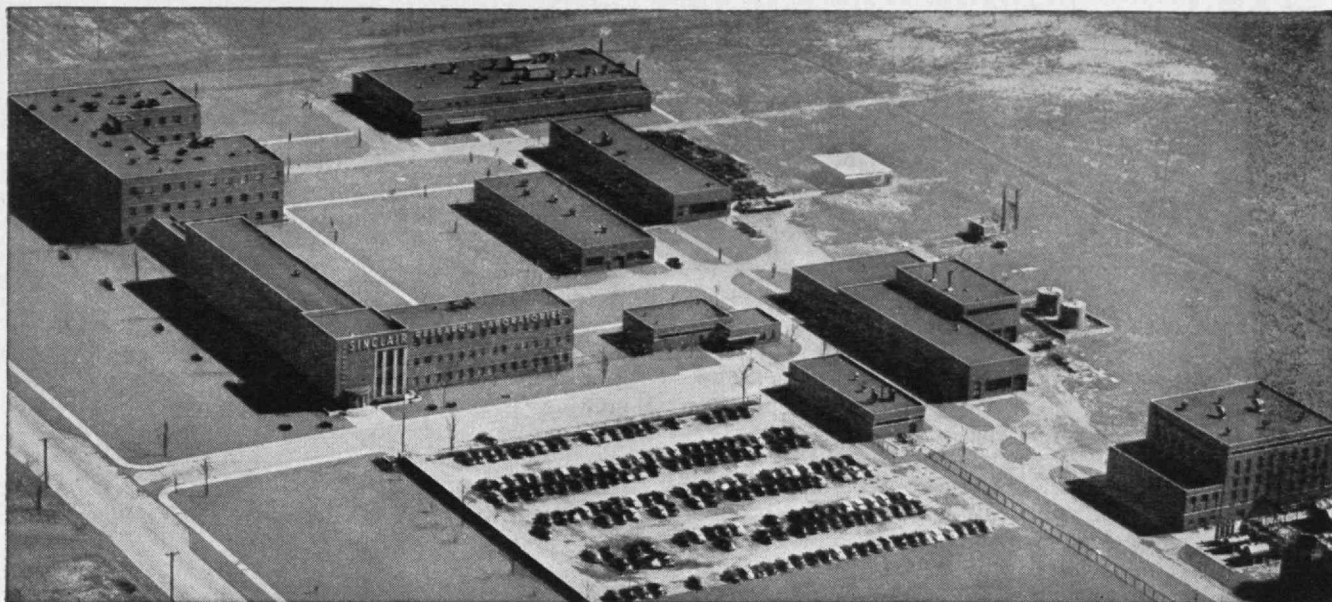


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In contrast, the man with a new idea in airplane design today often needs a supersonic wind tunnel costing millions.

In short, science and invention have become so complex that a man with an idea for a better product often needs the assistance of an army of specialists and millions worth of equipment to prove his idea has value.

Within the petroleum field, the Sinclair Plan now offers to provide that assistance.

Under this Plan, Sinclair is opening up its great research laboratories at Harvey, Illinois, to independent inventors who have

sufficiently good ideas for better petroleum products or for new applications of petroleum products.

If you have an idea of this kind, you are invited to submit it to the Sinclair Research Laboratories, with the provision that each idea must first be protected, in your own interest, by a patent application, or a patent.

## **The inventor's idea remains his own property**

If the directors of the laboratories select your idea for development, they will make, in most cases, a very simple arrangement with you: In return for the laboratories' investment of time, facilities, money and personnel, Sinclair will receive the privilege of using the idea for its own companies, free from royalties. This in no way hinders the inventor from selling his idea to any of the hundreds of other oil companies for whatever he can get. Under the Plan, Sinclair has no control

over the inventor's sale of his idea to others, and has no participation in any of the inventor's profits through such dealings. Moreover, it is a competitive characteristic of the oil business that the new products adopted by one company are almost invariably adopted by the whole industry. This means that the very fact of his agreement with Sinclair should open up to the inventor commercial opportunities which might otherwise be hard to find.

**How to proceed:** Instructions on how to submit ideas under the Sinclair Plan are contained in an Inventor's Booklet available on request. Write to: W. M. Flowers, Executive Vice-President, Sinclair Research Laboratories, Inc., 600 Fifth Avenue, New York 20, N. Y. for your copy.

**IMPORTANT:** Please do not send in any ideas until you have sent for and received the instructions.

# SINCLAIR—A Great Name in Oil



## PRESIDENT'S REPORT

(Continued from page 100)

dergraduate years, to integrate the various aspects of the student's work and help to make the student's college experience become meaningful as a unified whole.

Let me give a few examples of some of the changes made by several departments this past year to improve the undergraduate offerings.

(a) In accordance with a general trend at the Institute, the curricula of several courses have been modified to permit the student more freedom in electives. . . .

(b) The Physics Department, in addition to the most thoroughgoing reorganization of the content and sequence of courses in 20 years, has paid special attention to the improvement of teaching. . . .

(c) A plan for employment of juniors and seniors was worked out with Geophysical Service, Inc., of Dallas by the Department of Geology this past summer. . . .

(d) A four-year undergraduate program in Biochemical Engineering has been offered by the Department of Food Technology on the recommendation of its Visiting Committee. . . .

(e) Interesting innovations have been taking place in the two options of Course IX, General Science and General Engineering. Last May M.I.T. and Harvard University jointly announced plans for a five-year program aimed at increasing the number of broadly trained science and mathematics teachers available to secondary schools and junior colleges. . . .

**Undergraduate Housing.** During the past year, important improvements in the Institute's program of student housing have been made. This program

is covered, in part, by the following paragraphs from President Killian's report:

One of the long-range educational goals of the Institute has been to provide an environment for its students which performs in the broadest sense an educational function in itself. The addition of Baker House and now of Burton House gives us a housing system, including fraternities, which is ample for our present student body. This fall, for the first time in the history of the Institute, we could offer every freshman an opportunity to live in a dormitory.

The addition of nearly 1,000 new accommodations in the brief period of two years has required many changes in dormitory policies and operations. There have been growing pains, and we must expect still further adjustments before the system is operating with the effectiveness desired. . . .

In speaking of the road ahead for undergraduate education, the report continues:

The steady refinement of undergraduate education within and without the classroom, as I have outlined it, is an earnest of this community's creative interest in the undergraduate. While steady progress has been made in advancing undergraduate education, many problems remain which will require boldness and imagination to solve. Questions commanding attention include:

(1) What kind of graduate should we seek to produce in the years immediately ahead? . . .

(2) How can we provide adequate incentives for outstanding undergraduate teaching? . . .

(3) How can we insure continuing high quality in our entering classes? . . .

(Continued on page 104)

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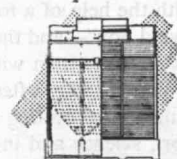
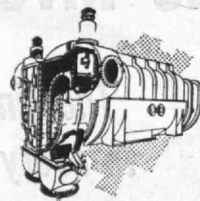
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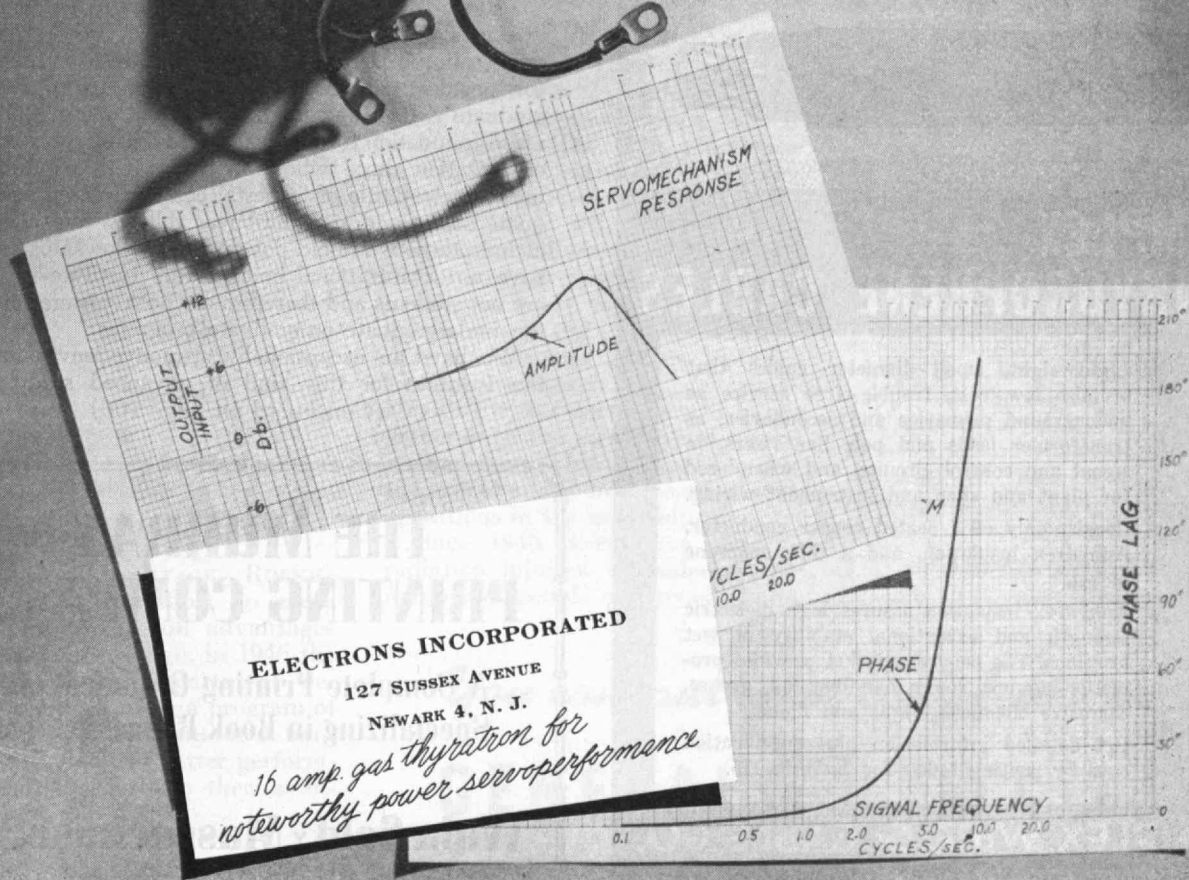
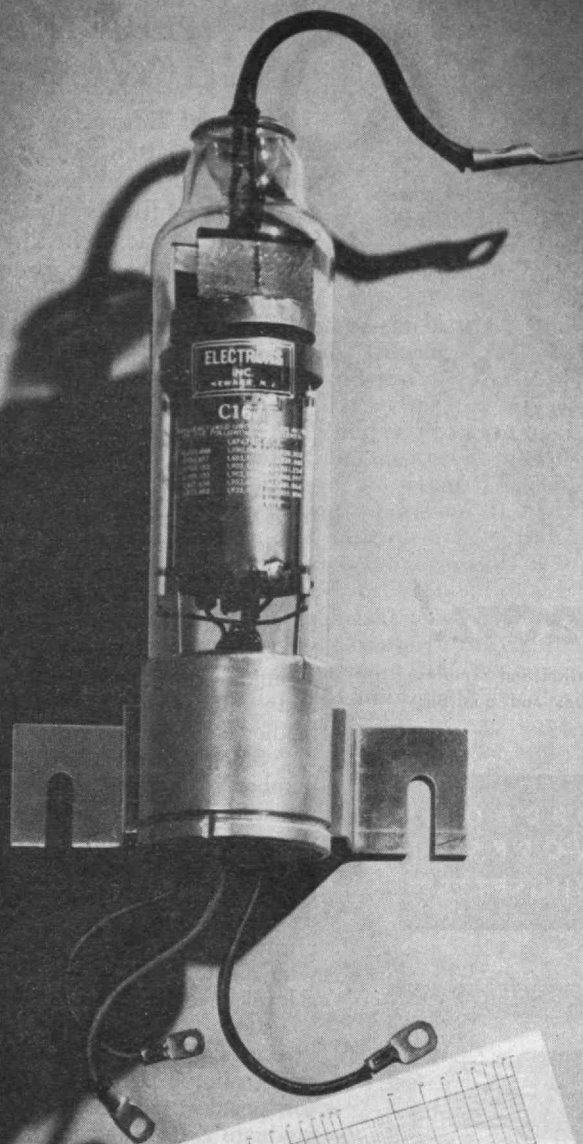


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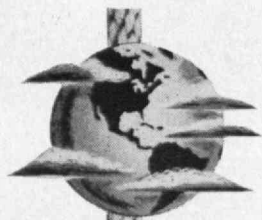


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## PRESIDENT'S REPORT

(Continued from page 102)

**Advanced Education at the Institute.** But while considerable attention has rightly been given to improving undergraduate study, advanced study has also come in for its share of attention. The article, "Graduate Students in Physics," by Professor Philip M. Morse of the Department of Physics, in the November, 1951, issue of *The Review* is an indication of the care to which attention is given to graduate instruction in one field of science. The Institute has long stood high in its output of advanced degrees in engineering, and examining the growing contribution of M.I.T. in the sciences, President Killian continued:

During the past year we received a grant of \$175,000 from the Commonwealth Fund to enable the Department of Biology to provide postdoctoral training for men who have completed their medical education. Our Department of Biology has been attracting an increasing number of men who have completed their work for the M.D., and who wish to acquire advanced research techniques in the field of biology which will make them more effective for careers of research in the field of medicine.

Since World War II we have attracted an increasing number of scholars engaged in postdoctoral study and research. A number of these mature men and women come to the Institute on its invitation and are given appointments as "Guests." Others come on postdoctoral fellowships awarded either by the Institute or by outside agencies. The group join our community, not for the purpose of studying for degrees, but in order to work with members of our Faculty and in our laboratories at a level beyond our Graduate School degree program.

I suggest that the time is approaching when we should give more formal recognition to this advanced group. We might appropriately establish an institute or foundation for postdoctoral studies, thus adding to our Undergraduate School and Graduate School a formally recognized foundation for advanced study. Through some such organization those who now work with us under the unsatisfactory title of "Guests" could be given more adequate status and recognition as fellows. We could also include those who hold postdoctoral fellowships and who have no organizational home at the Institute since they are not students and therefore are not registered in either the undergraduate or graduate programs.

We have an exceptionally attractive environment at the Institute for this kind of advanced study, and I  
(Continued on page 106)

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# What GENERAL ELECTRIC People Are Saying

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## *Research Laboratory*

**STERILIZING FOODS AND DRUGS WITH ELECTRONS:** Probably the most promising and imminent application of high energy cathode rays is in the field of sterilization. Studies to determine the lethal effect of cathode rays on various types of bacteria and mold cultures indicate that the spore formers of the bacteria are more resistant than the non-spore formers, and that the bacteria are more resistant than the mold cultures. Likewise, some preliminary data with viruses indicate that they are still more resistant than the bacteria. A dose of a million roentgens was found to be lethal to bacteria concentration of approximately  $10^8$  per cc, while approximately 0.3 million roentgen was the lethal dose for molds.

The lethal effect produced by the irradiation in the case of bacteria has been attributed to the result of a single ionization in a sensitive volume within the cell.

Sterilization without appreciable temperature rise is what makes the application of cathode rays to sterilization an attractive one and in particular, for use in those cases of temperature sensitive materials. It appears that many types of heat sensitive pharmaceuticals such as antibiotics and hormones can be electron sterilized in their final glass or plastic containers without reduction in potency of the material or other adverse effects.

4th District Branch  
Medical Society of the  
State of New York  
September 20, 1951



R. P. HAVILAND

## *Large Apparatus Division*

**"BUMPER," TWO-STAGE ROCKET PROGRAM:** In an effort to more nearly realize the full advantages of a multi-stage design, in 1946 the Army Ordnance Department decided to embark upon a program of design and development of a two-stage test vehicle of better performance than any vehicle then available.

A co-operative program, called "Bumper," was established. Basic responsibility for the program was assigned to General Electric's Project Hermes.

The vehicles selected were the American WAC Corporal for the second stage, and the German A-4 (V-2) for the first stage.

So far, the Bumper Program has: (1) demonstrated the techniques of launching large two-stage vehicles and of securing separation at high velocities and altitudes; (2) established a new velocity record of 7550 feet per second, or 5150 miles per hour; (3) established a new altitude record of 250 miles above the earth; and (4) demonstrated two-way communication with an object 250 miles above the earth—this being above the D, E, and F layers of the ionosphere.

Electrical Club of  
Montreal, Canada  
October 24, 1951



H. M. ROZENDAAL, M.D.

## *Research Laboratory*

**NEW INDUSTRIAL HAZARDS:** A review of the literature on health aspects of the Atomic Energy industry indicates the enormous scope of the problems involved. The experience of the last 10 years makes it clear that a new industry has been developed which is already larger than most other industries in the United States and the operation and products have many significant effects upon workers and general public.

In the Atomic Energy installations there have been developed Health Physics branches which together with the medical and safety groups have been responsible for the exceptionally fine record of safe operations in the new industry.

Since 1946 there have been 5 radiation injuries. Considering the number of people employed in the

new industry and the types of hazards encountered, this is a remarkable record of accident prevention. The execution of this program of radiation protection has cost the A.E.C. between \$3 and \$4 of every \$100 spent for operations. There is reason to believe that experience and new knowledge may decrease this cost and possibly produce greater operation efficiency.

13th Ohio State Safety Conference  
Cleveland, Ohio  
September 18, 1951



M. M. BORING

## *Technical Personnel*

**TOMORROW'S ENGINEERS:** I consider you who work in our offices and laboratories the most important group I can possibly reach . . . I am asking you to make your voices heard by those who are coming up through our schools so that they will not deny themselves the advantages of an engineering career because of the ridiculous belief that engineers are a dime a dozen.

But how? Many of you are members of engineering societies and can take action in your communities by presenting facts to school guidance counselors and teachers and speaking before assemblies and classes. Many of you as parents and members of PTAs can tell your story effectively. Don't sell the parent short in your thinking, for the records prove that many careers are the fulfillment of parents' wishes that their children become happy and successful.

Use your facilities. You have the facts. Surround those facts with the romance of the profession—the challenging problems and the brilliant solutions—and drive for action.

General Electric MONOGRAM  
November–December 1951

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## PRESIDENT'S REPORT

(Continued from page 104)

recommend that we develop it in a more formal way as the third component of our program.

**Summer School Program.** Five professional conferences and 19 special summer courses brought over 2,200 men and women to the M.I.T. campus this summer, in addition to our regular students who returned for summer work. Some 400 organizations had representatives here, including over 300 industrial companies and 40 United States Government agencies. In a majority of the special summer programs we could have had half again as many in attendance if we had had the facilities and the instructors to take care of them. We were able to house most of the summer guests at Baker House or elsewhere on the campus, and this has added to the attractiveness of our Summer Session. . . .

The chief problem of our active Summer Session arises from its success. There is a demand and a temptation to multiply the number of special courses and conferences to the point where we overload our Faculty. It is my hope that we can avoid doing this, and that we can manage more of our summer programs with teachers drawn from other institutions. . . .

**Defense Research.** Turning to the Institute's program of research for defense, President Killian pointed out that since June 1, 1950, the Institute has accepted responsibility for the organization and management of several comparatively new types of research projects for the government. These projects involved little laboratory research; they were, in fact, panels of experts so organized and briefed that they could be uninhibited in thinking about their assignment — in each case a strategically important "systems" problems. The groups completed their work in a relatively short time and without disrupting too much the normal work of those engaged in the projects. Through the operation of such analytical groups, which were pioneered by M.I.T., a new order of civilian ingenuity has been brought to bear on complex problems of systems and strategy. In addition to such projects of the conference type, the Institute is engaged in research activities of the more familiar variety. Speaking of some of these, President Killian stated:

The Institute is making important contributions to our national security through a number of other important projects. In behalf of one of these we are adding an additional story to our Gas Turbine Laboratory to pro-

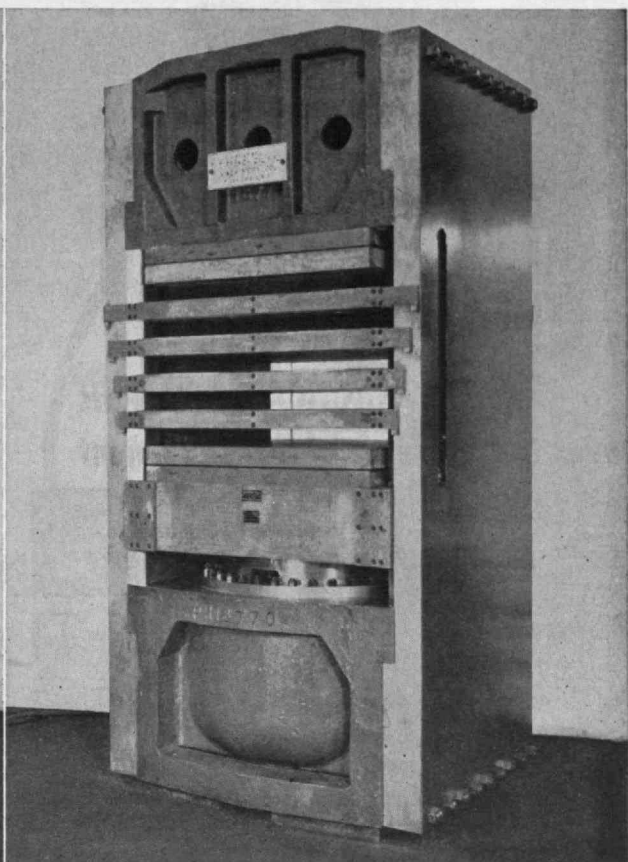
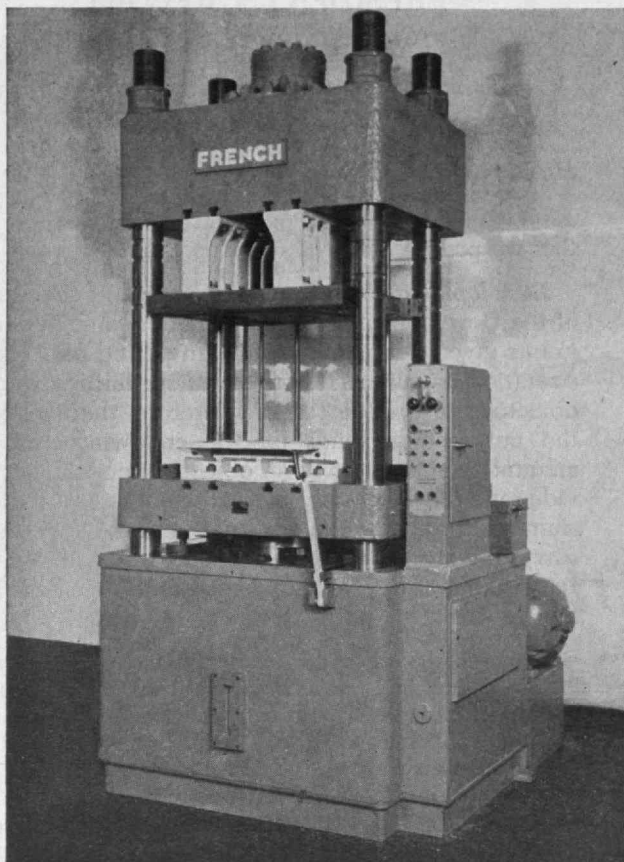
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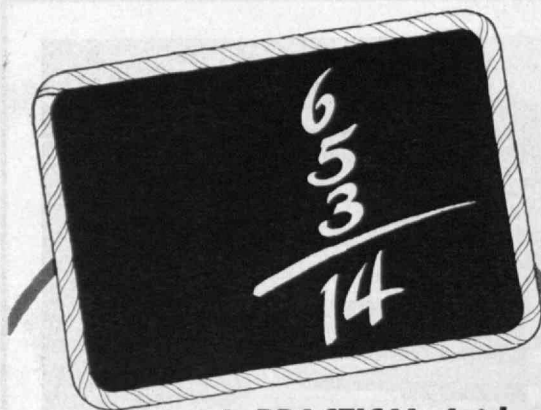
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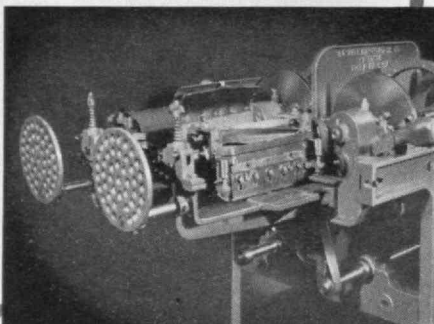
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## PRESIDENT'S REPORT

(Concluded from page 106)

vide laboratory facilities for our combustion group in Chemical Engineering.

These defense projects impose heavy burdens and sacrifices on our staff. We have accepted them in response to insistent appeals from the government and only after becoming convinced of their importance and that we possessed special resources . . .

**Development Program.** The successful conclusion of the Development Program includes some gifts and grants given during the campaign period for current operations, as well as those given specifically for the objectives of the campaign. Therefore, the final total did not include funds for the endowment in the amount originally set as an objective, nor did it provide for a laboratory of physical sciences or a gymnasium. Accordingly, the Institute is seeking funds to carry through to fruition these unrealized objectives. In speaking of the Development Fund, President Killian reported:

When all the objectives of the Development Program have been reached, major building needs will have been amply met, and we should not need to seek other major funds for buildings for a long time. From this point on our fund raising should be directed mainly toward increasing the Institute's permanent funds. . . .

I have suggested that we should seek to add at least \$2,000,000 a year on the average to these permanent funds, while maintaining our present level of gifts for current use. Since 1940, the book value of the Institute's total invested funds has increased from \$36,000,000 to \$54,000,000. This rate of growth, while gratifying, can be accelerated. Funds for endowment are the most difficult of all to obtain, but additional endowment is M.I.T.'s most acute need at the present time. Especially do we need funds adequately to endow our permanent tenure salaries. We need at least 20 additional endowed professorships. As I pointed out last year, we need more endowment for scholarships. It is my hope and that of the treasurer that every possible gift to the Institute be earmarked for these and other permanent funds. . . .

The remainder of President Killian's annual report was devoted to an outline of administrative and personnel changes, and to statistics of the year — of which, for the most part, the more important have already been recorded in the pages of *The Review* for Volume 53. In conclusion it expresses appreciation to the members of the M.I.T. Corporation, Faculty, and staff who have "helped to make M.I.T. a happy place in which to work and study."

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All replies to be held confidential. Please write to Box G  
Technology Review.

SA-3

PAGE TWENTY-TWO

## Industry:

# Cabot Introduces New Oil Furnace Black

**GODFREY L. CABOT, INC.**  
77 FRANKLIN ST., BOSTON 10, MASS.

Boston — Godfrey L. Cabot, Inc., world's largest individual producer of carbon black, has just announced the development and commercial availability of Sterling V, a new type oil furnace black incorporating the properties of high modulus, semi-reinforcing and fast extruding furnace blacks. The "V" in the new brand stands for versatility.

The combination of superior resilience properties and high modulus recommends the new black for tire carcasses, side wall and tread base stocks. The improved processing characteristics lend it to the production of mechanical, wire, footwear and extruded goods in general. Because of the versatility possible with Sterling V application, Cabot has proposed a new classification, namely GPF — General Purpose Furnace.

Development of Sterling V is another step in the Cabot plan, initiated ten years ago, to meet threatened gas shortages and rising natural gas prices. The Cabot goal is to produce a complete range of high quality blacks from raw materials not subject to the economic pressures affecting natural gas.

Cabot blacks, produced in the widest range of grades available to industry, are used extensively in the manufacture of rubber, ink, paint, varnish, lacquer, plastics and paper products.







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## WHAT KIND OF INCENTIVES?

(Concluded from page 82)

in the native intelligence of the voting public; as if they adopted every means at their disposal to make them believe that government spending and the resultant high level of taxation were in some way removed from their own shoulders. This is perhaps only human, and very probably the desire to conceal the impact of government spending would not be greatly different whatever party were in power.

Nevertheless public deception is not only dangerous but quite unnecessary. I have the most complete faith in the wisdom and intelligence of an informed public. Our difficulties arise only when a few undertake to decide what is best for the great majority. The writer is convinced that it is the duty of all of us to bring to the general public sound and objective information as to the effect on their own welfare of the policies government is now adopting. This must be done by every means we have, by every avenue of communication that is open to us. It is important also not to dilute the force of our efforts by name calling or political backbiting. It is the truth that is important.

We may have confidence that an informed public will act with wisdom and with justice. We have seen that Americans will give generously to the defense of their country and to any project that seems to them in the national interest. But they would never tolerate spendthrift policies if they knew how much those policies reduced their own economic well-being, nor would they willingly see their nation stalled by removing the spark plugs of incentive.

### Two Centuries of Experience

Granting that it is far from perfect, we have a way of life that has given more to more people than any other the world has seen. I am certain that, while they mean to improve it, Americans would never knowingly trade it in for any other system. And why indeed should they, when its benefits have been so clearly demonstrated for nearly two centuries, through all shades of economic climate?

Just as the Scriptures afford a code of moral behavior, our constitution provides us with a declaration of principles to guide our conduct as individuals and a nation. Its basis is human freedom. Its tools are truth, honesty, and objectivity. Without them, freedom becomes an empty word, devoid of all of its real meaning.

These are anxious times, here and abroad. We find sham and deceit triumphant in many parts of the world; they are not wholly strangers here at home. If we are to keep our place as a strong and free nation, it is time that we re-examine our faith in the principles for which we have stood so long and so successfully. Let us get back to the truth, the honesty, and the objectivity that have served us so well. Let us insure our habit of personal achievement, which has made us a great nation. Then, and only then, will we be able to find the strength that lies in devotion to freedom, and thereby help to restore that priceless blessing to a troubled world.

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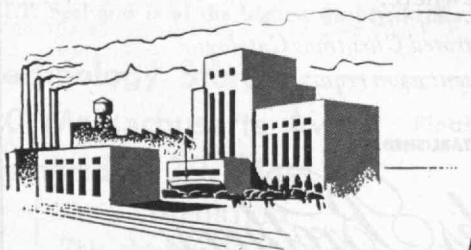
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## MEDICAL MARVELS IN KOREA

(Concluded from page 84)

ties for infection and infestation are omnipresent. Most Korean water supplies are also contaminated and must be carefully sterilized before use. Despite these ubiquitous dangers, there were only half a dozen mild cases of typhoid fever among all the many thousands of Allied troops. Nor has there been any appreciable amount of typhus fever, an invariable and highly fatal accompaniment of warfare in the past. Malaria has caused trouble, but this disabling disease has been kept low by means of chloroquine, the newest and most effective of the malaria suppressive drugs, better than the Atabrine of World War II.

If the United Nations soldiers have been adequately protected against the hazards of contagious and infectious diseases, the same cannot be said for the enemy. The North Koreans have had relatively few competent doctors, and too often have had to depend only on ancient, and inferior, herbal medicine or Han-ei. The Chinese Communists, with their masses of man power, seem to hold life cheaply and to pay little attention to medical care and sanitation.

Enemy casualties in battle in Korea in a year's time are estimated to have been more than 870,000 as against the 66,478 killed and wounded among the United Nations forces in that period, or a ratio of considerably more than 10 to one in our favor. Although there have been some daring medical in-

vestigations behind enemy lines, no one can say accurately what has been the Communist toll from disease; undoubtedly it has been much greater than the appalling losses in battle. Typhus fever, smallpox, typhoid, and dysentery are definitely known to have been excessively prevalent and at times epidemic in the Communist armies. As has occurred so often in history, diseases such as these and others contribute to the defeat of the invading hordes.

Despite the regrettable costliness of this conflict in valued American and Allied lives and matériel, the campaign has had some favorable assets. This war has converted inexperienced soldiers into tough, wily, trained fighting men; it has demonstrated to our enemies that we are no "push-over." This campaign also has produced many worth-while lessons in medicomilitary science. It has furnished incomparable opportunities for medical research, with results obtainable in months under the tempo of modern warfare, rather than in the years required for similar studies under the complicated conditions of civil life. The results of much of this research already have been translated into action.

The record of our army medical services in the Korean campaign, like the record of our combat forces, has been a glorious achievement, and it is no wonder that more than 2,800 decorations have been awarded to these medical soldiers. In an era in which the finer things of life seem too often to be overwhelmed by the sordid, that is something to make us feel proud.



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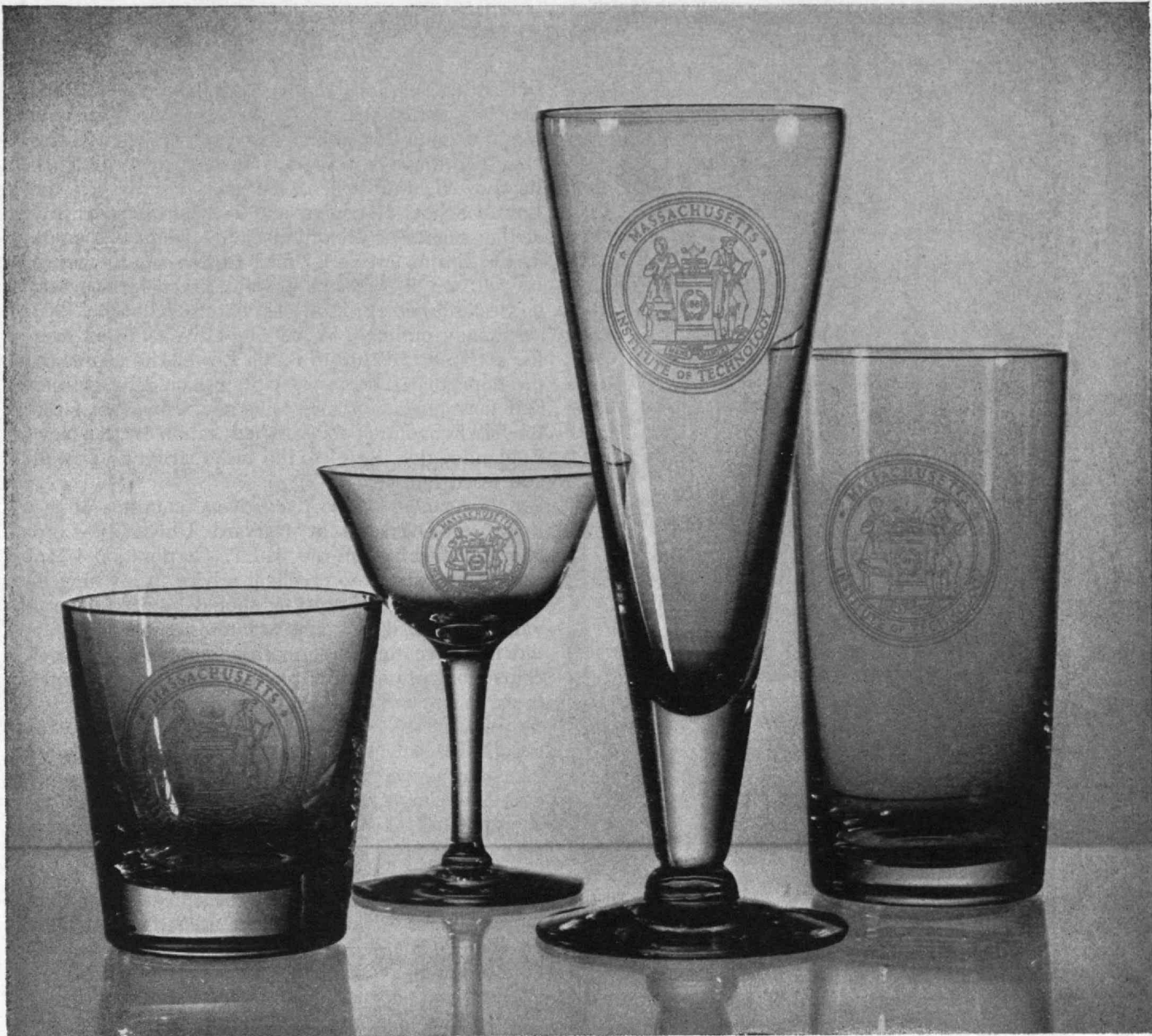
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the first trustee, John Amory Lowell, who established the course of lectureships under the terms of the will. He also founded the first school of drawing in this country during his 40 years as trustee. His son, Augustus Lowell, a trustee for 20 years, established the Lowell School of Design and also introduced many of the courses of a cultural nature which are given in the Boston area. As third trustee, A. Lawrence Lowell, son of Augustus Lowell, served for 40 years and established the Lowell Institute School in 1903 as already outlined. When Dr. Lowell turned over the active trusteeship to Ralph Lowell, he expressed the hope that the present trustee would be able to find new media for increasing the influence of the Lowell Foundation in adult education in the New England region. It was to this task that Ralph Lowell addressed himself.

As a member of the Executive Committee of the Board of Overseers at Harvard University — and later as member of the M.I.T. Corporation — Mr. Lowell had access to excellent advice in his suggestion that radio broadcasting should be able to provide educational programs to interested persons who did not have time or opportunity to attend school courses or lectures organized on a more or less formal basis. It became evident that the educational facilities of Boston were uniquely suited to education by radio, especially since the resources of several colleges and universities might be tapped for this project. Accordingly, the Lowell Institute Cooperative Broadcasting Council was organized in 1947 and educational programs were transmitted over a number of Boston's broadcasting stations. Although this venture was well received, it became evident that more effective service might be rendered if the Council could operate its own station. This fall, as announced in the November, 1951, issue of *The Review*, WGBH was opened as the frequency-modulated broadcasting station of the Council, the "bricks and mortar" portion of the project being supported by members of the Council. At first composed of Boston College, Boston University, Harvard University, M.I.T., Northeastern University, and Tufts College, two new members of the Council have been added this year. They are the Boston Symphony Orchestra — whose concerts on Friday afternoon and Saturday evening are broadcast on 89.9 megacycles per second — and the New England Conservatory of Music. In addition to musical programs of high caliber, the Council also arranges to broadcast lectures and classroom discussions.

It is impossible to predict what the future has in store. Our way of life has changed drastically since the lectures were initiated and undoubtedly the next century will see even more drastic changes. But there is every reason to expect that the wise provisions of the will of John Lowell, Jr., administered in the best interests of public welfare by a member of one of Boston's first families, will bring to residents of New England, as a much needed stimulant to the culture of our times, the best that is obtainable in adult training and education.



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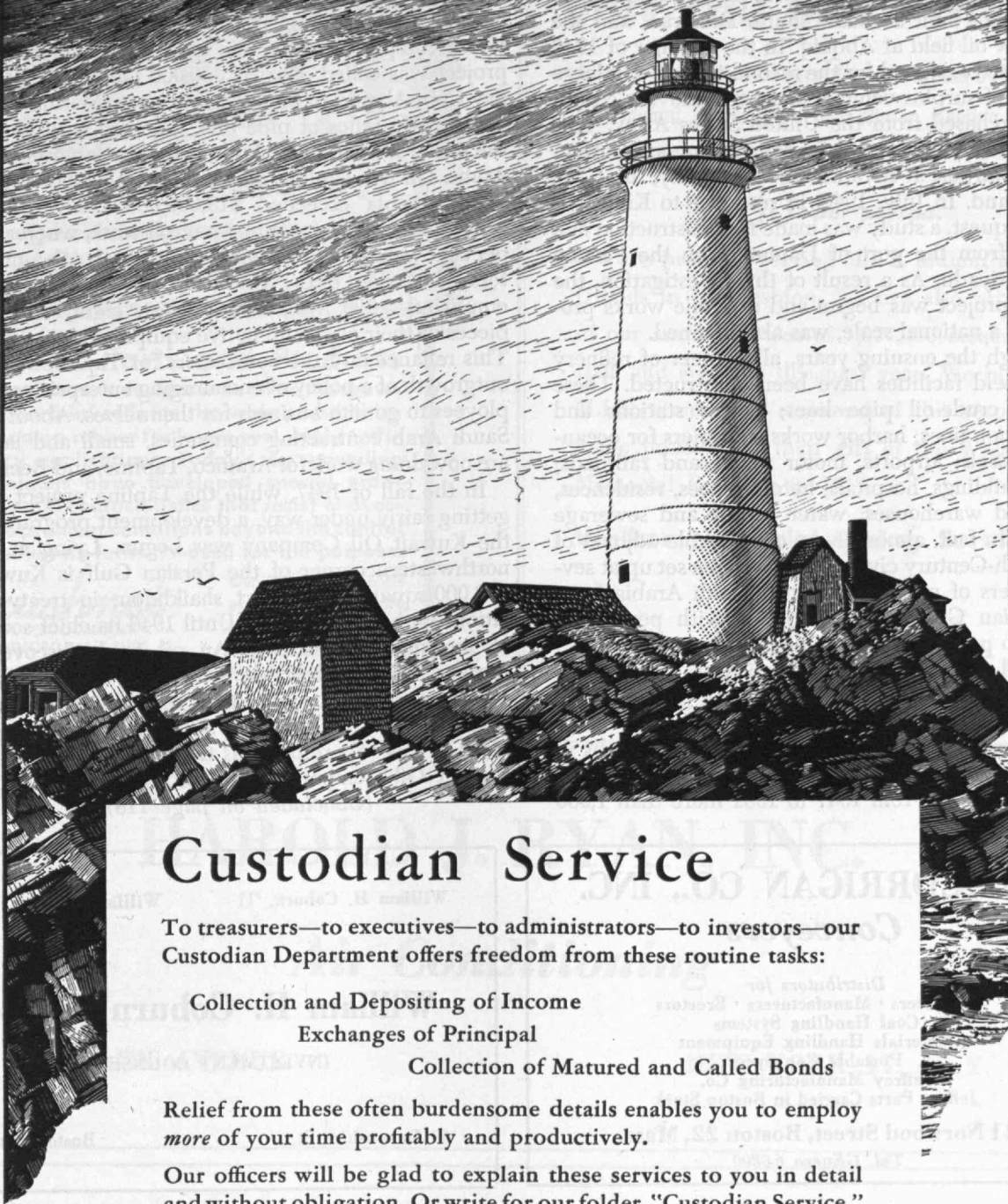
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## AMERICAN TECHNOLOGY

(Continued from page 90)

refinery, with a capacity of 115,000 barrels per day, an oil-loading pier, electric power plant, and other facilities were built at Ras Tanura, Dhahran, and the great new oil field at Abqaiq. In the summer of 1946 a contract was signed for the reconditioning of a large quantity of surplus vehicles and earth-moving equipment purchased from the United States Army. This soon led to an assignment for the grading and surfacing of an airport at Riyadh, the capital city, some 300 miles inland. In July, 1946, in response to King ibn-Saud's request, a study was made for construction of a railroad from the port of Dammam on the Persian Gulf to Riyadh. As a result of this investigation, the railroad project was begun and a public works program, on a national scale, was also planned.

Through the ensuing years, all manner of refinery and oil-field facilities have been constructed. These include: crude-oil pipe lines; power stations and transmission lines; harbor works, and piers for ocean-going vessels; airports, motor roads, and railroads; public buildings, hospitals, hotels, offices, residences, shops and warehouses; water supply and sewerage systems. In fact, almost every conceivable adjunct of Twentieth-Century civilization has been set up at several centers of population across Saudi Arabia from the Persian Gulf to the Red Sea with permanent benefit to people in the Middle East.

Bechtel operations for the Saudi Arab Government have been carried on since 1946 with never more than 160 Americans on all projects, and an average of 90. The policy has been to employ and to train Arabs in all the crafts, using Americans mainly as instructors and supervisors. From 1947 to 1951 more than 1,000

Arabs were regularly employed on government work, while an even larger number were employed on Aramco projects.

An extensive pipe-line system across Saudi Arabia, Trans-Jordan, Syria, and Lebanon was begun in 1947, on behalf of the Trans-Arabian Pipe Line Company. When completed at the end of 1950, Tapline, as the project was called, carried 300,000 barrels of oil per day from Abqaiq to the Mediterranean. Within Saudi Arabia, 854 miles of pipe line, together with four of the pump stations, were built, using the labor of 5,000 Arabs. On the Tapline project the Arab labor cost in Saudi Arabia exceeded \$13,000,000 — only 10 per cent of which was for direct payroll work, whereas 90 per cent went for work done through Arab subcontractors. The largest of the Arab contracting organizations employed 2,200 men, the smallest, eight, and 200 pieces of their own automotive equipment were used. This reliance on Arab contractors for Tapline was an outgrowth of a policy of encouraging enterprising employees to go into business for themselves. About 112 Saudi Arab contracting companies, small and large, are now doing work for Aramco, Tapline, and Bechtel.

In the fall of 1947, while the Tapline project was getting fairly under way, a development program for the Kuwait Oil Company was begun. Lying at the northwestern corner of the Persian Gulf is Kuwait, a 6,000-square-mile desert shakhdom in treaty relations with Great Britain. Until 1946 its chief source of income was pearling. An oil field, discovered there in 1936, but left dormant during World War II is rated as one of the largest single fields in the world, with a reserve of about nine billion barrels. Development of this vast resource is the responsibility of the Kuwait Oil Company which brought the field into  
(Concluded on page 118)

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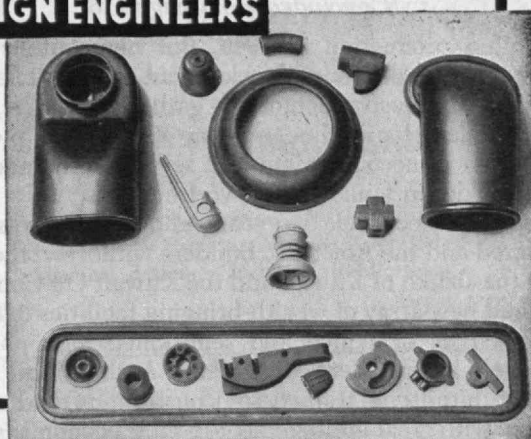
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## **AMERICAN TECHNOLOGY**

*(Concluded from page 116)*

limited production in 1946. But new outlets were sorely needed. Proper development of this oil field entailed the construction of five gathering centers, some 600 miles of pipe line, and an oil-shipping pier big enough to accommodate and service simultaneously a half dozen tankers and two freighters.

The project took two years, and when it was completed and the American builders withdrew, they left to the shaikh of Kuwait and the Kuwait Oil Company a vast new array of wealth-bringing facilities operated by a pool of skilled and semiskilled man power — largely native. Here, as in Saudi Arabia, local Arabs were hired and trained for construction and operation, with great improvement in their economic status.

Another project on which the potentialities of local labor were to be fully utilized was the 30- and 32-inch 556-mile crude-oil pipe line (constructed for the Iraq Petroleum Company, Ltd.) running from the Kirkuk field in Iraq to Banias on the Mediterranean Coast of Syria. With only a skeleton staff of Americans and Britons (administrators of the firm), several thousand Syrians and Iraqis are being employed.

For many years one of the most beneficial educational institutions in the Middle East has been the nonsectarian and privately conducted American University of Beirut, Lebanon. A new engineering school is being established there to turn out graduates who will assume roles in the development of petroleum resources of their countries.

Since first venturing into the Middle East, only a score of years ago, American oil men have been keenly conscious of their responsibilities in their relations with peoples and governments. They have consistently sought to do business on a friendly give-and-take partnership basis with their hosts. This policy has worked out with mutually beneficial results — a matter of considerable international importance.

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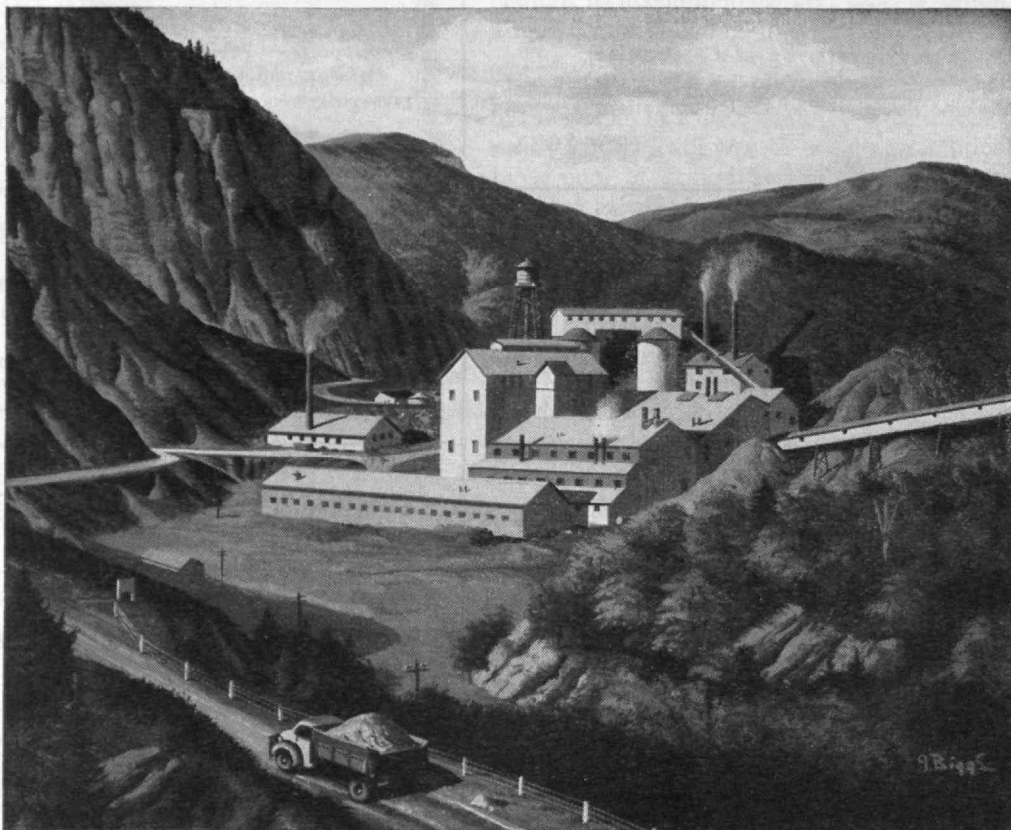
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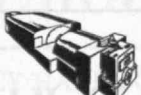
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*In my report a year ago, I gave special attention to the policies appropriate for our institution in a period of national rearmament and indefinite emergency. I ventured to suggest that we should hold fast to our normal program and long-term objectives, this being the most effective way we could serve the nation in the present period. I suggested further that we should hold ourselves in a state of readiness to meet any sudden change in national policy or need, and that we should be prepared to accept additional responsibilities in behalf of national defense.*

WITH these words President Killian began his 1951 report to the Corporation. This "strategy for uncertainty" seems eminently proper for a world situation whose very basis is uncertainty. It does, however, introduce many problems not present in a more stable period, and not the least of these problems are in finance. Never has the need for fluid funds been greater, and our annual program of giving becomes increasingly important as a consequence.

THE Alumni Fund is not to be used for annual recurring operating expenses of the Institute, nor is it to be used to make up deficits. Rather, it is to be applied to capital needs. The Charles Hayden Memorial Library and Baker House, erected in part with Alumni Fund money, are examples. So are the Briggs Field tennis courts and a portion of the Humanities Library. The availability each year of additional funds for much-needed facilities releases Institute funds which would otherwise have to be expended, makes it possible to use them as a cushion against the uncertainties of the future.

YOUR contribution to the Alumni Fund helps to implement the Institute's well-conceived "strategy for uncertainty," helps to give it substance. If you have not yet given, won't you do so now?



# Alumni AND Officers IN THE News

## Advancing Alumni

The Economic Cooperation Administration has appointed JOHN W. NICKERSON '09 to the key post of senior consultant on the ECA's productivity and technical assistance program.

PIERRE F. LAVEDAN '20 was elected chairman of the board, and WILLIAM A. BROWN, JR., '31, was chosen president and general manager of the Liquid Carbonic Corporation in Cambridge.

KENNETH C. REYNOLDS '25 has been elected chairman of the University Senate for the academic year 1951-1952 at the University of Southern California. This office is the highest elected one of the University's faculty.

The J. T. Baker Chemical Company of Phillipsburg, N.J., has promoted JOSEPH R. STEVENS '30 to vice-presidency of the firm.

FRANCIS R. O'LEARY '31 was elected a vice-president of the Curtiss-Wright Corporation, Wood-Ridge, N.J.

## With Pen in Hand

SAMUEL C. PRESCOTT '94 and W. H. Ukers have written a 40-page chapter on the subject of tea and coffee for Volume II of *The Chemistry and Technology of Food and Food Products*, published by Interscience Publishers, Inc.

The biographies of 12 men who opened up the advance of flight are gathered together under the title of *Architects of Aviation* by MAURICE HOLLAND '16 and Thomas M. Smith. Included among the biographies are those of JEROME C. HUNSAKER '12 and ALEXANDER KLEMIN '16, with a preface by JAMES H. DOOLITTLE '24. Publishers: Duell, Sloan and Pearce, Inc., 1951.

ROYAL BARRY WILLS '18 has written and illustrated a new book entitled *Houses Have Funny Bones*, published recently by the Bond Wheelwright Company of New York. In it, Mr. Wills relates humorous anecdotes of his many years of experience in small-house building.

HENRY B. KANE '24 has illustrated a new edition of Thoreau's *Walden*, published in November, 1951, by W. W. Norton Company. This completes a trilogy of books recently published, written by Thoreau, and illustrated by Mr. Kane—the other two being *The Maine Woods* and *Cape Cod*.

JOHN F. TAPLIN '35 and WILLIAM R. AHRENDT '41 collaborated on a book entitled *Automatic Feedback Control*, published by the McGraw-Hill Book Company, 1951.

HAROLD CHESTNUT '39 and ROBERT W. MAYER '41 are coauthors of *Servo-mechanisms and Regulating System Design*, Volume I, published by John Wiley and Sons, Inc., 1951.

T. WILLIAM LAMBE '44 has written *Soil Testing for Engineers*, published by John Wiley and Sons, Inc., 1951.

A new textbook entitled *Production and Inventory Control* has been written by WILLIAM E. RITCHIE '44 and published by the Ronald Press Company, 1951.

"After an A-Bomb Falls," an article in the September, 1951, issue of the *Atlantic Monthly*, was written by JOHN W. M. BUNKER, staff.

*Industrial Relations in Sweden* is the title of a book written by CHARLES A. MYERS, staff, published in 1951 by the Technology Press. This report was written by Professor Myers as a result of his trip to Sweden in the fall of 1950, undertaken at the request of Swedish industry and under the auspices of the State Department.

## Held in Esteem

Technology men have been active in the American Society of Civil Engineers, as indicated by the following elections within, and awards from, the Society: GEORGE W. BURPEE '06 was elected vice-president of the A.S.C.E.; WALTER D. BINGER '16, a director; and CHARLES G. HYDE '96, SAMUEL A. GREELEY '06, and FREDERICK OHRT '17, honorary members. JAMES G. TRIPP '10 received the Construction Engineering Prize; HUNTER ROUSE '29, the Karl Emil Hilgard Prize; and ALEXANDER P. HRENNIKOFF '40, the Arthur M. Wellington Prize from the Society.

SAMUEL A. GREELEY '06 has been awarded the Frank P. Brown Medal of the Franklin Institute "for his leadership in the profession of Sanitary Engineering and his many contributions to knowledge in that field which have particularly improved the welfare of urban populations."

The Lamme Medal of 1951 was presented to ALLAN R. CULLIMORE '07 by the American Society for Engineering Education.

For outstanding contributions in textile chemistry, R. W. JACOBY '10 was awarded the Olney Medal by the American Association of Textile Chemists and Colorists. Award of the Olney Medal is considered one of the textile industry's greatest honors.

JEROME C. HUNSAKER '12, chairman of the National Advisory Committee for Aeronautics, received the 1951 Wright Brothers Memorial Trophy, given by the National Aeronautics Association for "significant public service of enduring value to aviation."

EDWARD R. SCHWARZ '21, Professor of Textile Technology at M.I.T., received the second Harold DeWitt Smith Memorial Medal of the American Society for Testing Materials for outstanding accomplishment in the science of utilization of textile fibers.

MARTIN J. BUERGER '24, of the Geology Department of M.I.T., received the Arthur L. Day Medal at the November 8th meeting of the Geological Society of America.

HAROLD E. EDGERTON '27, of the De-

partment of Electrical Engineering at M.I.T., received the U.S. Camera Achievement Award Gold Medal on November 6, for "his enormous contributions to the research and development of the many aspects of stroboscopic photography."

The John H. Potts Memorial Award of the Audio Engineering Society was presented on November 1 to HERMON HOSMER SCOTT '30, for outstanding achievements in the audio engineering field within the last year.

## Obituary

NATHAN O. GAY '84, date unknown.

HUGH MACRAE '85, October 20.\*

JAMES C. DUFF '86, October 7.\*

BURTON D. BLAIR '91, August 30.

WALTER T. LITTLEFIELD '92, September 23.\*

JOHN G. MORSE '92, March 30.\*

WILLIAM E. SCALES '92, April 3.\*

JAMES W. G. WALKER '92, November 2, 1950.\*

GROSVENOR T. BLOOD '93, October 24.

FRANK H. MERRILL '93, October 12.\*

PHILIP E. PERRY '93, September 30.\*

HOWARD S. REYNOLDS '94, August 29.\*

FRANK M. BRININSTOOL '95, October 18, 1950.\*

CONRAD H. SLADE '97, September 11, 1950.\*

HENRIETTA C. DOZIER '99, date unknown.\*

FREDERIC E. EVERETT '00, September 18.\*

CHESTER A. RICHARDSON '00, September 8.\*

ROBERT B. MORTON '01, May 19.\*

WILLIAM C. PETERS '02, September 30.\*

HENRY H. FLEISHER '05, November 13, 1949.

ROBERT FOWLER '05, in August.

ASA H. NUCKOLLS '05, August 31.\*

ROSS P. SCHLABACH '05, August 26.\*

F. CHAS. STARR '05, June 11.\*

CHARLES G. VAN BRUNT '05, May 2.\*

JOHN R. WALL '05, May 12, 1942.\*

STATIRA CALDWELL McDONALD '06, June 28.\*

GARNETT A. JOSLIN '09, September 20.\*

HAROLD SHARP '09, September 9.\*

RALPH M. GEORGE '10, September 15.\*

ARTHUR L. STEIN '10, August 29.\*

STANFORD H. HARTSHORN '11, October 23.

JOSEPH A. BALL '15, August 27.\*

SIDNEY W. KITSON '20, August 28.\*

EDWARD F. BOWDITCH '22, April 28.\*

JOHN L. EWART '22, date unknown.

EVERETT W. HOWE '22, May 24.\*

ISAAC MARK, JR., '22, May 15.\*

HAROLD W. SMITH '22, August 4.\*

CLARENCE W. ROW '23, August 2 (reported in November class notes).

RAYMOND JOHNSON '24, May 12.\*

DONALD J. MILLER '28, September 29.

RALPH E. MAW '31, October 14.

JOSEPH H. KLABER '38, December 15, 1947.

JAMES A. STEVENSON, JR., '49, September 14.\*

SAMUEL C. BIDWELL '50, July 27.\*

\* Mentioned in class notes.

# News FROM THE Clubs AND Classes

## CLUB NOTES

### *The M.I.T. Club of Chicago*

On October 4, the Club was the guest of the Inland Steel Company of Indiana Harbor, Ind., and, in a very successful evening meeting, opened the 1951-1952 season. F. Curtis Smith '43 was kind enough to provide the following account of the trip:

The Club, under the leadership of its new president, Phil Coleman '23, staged the fourth in a series of highly successful plant tours on October 4. About 250 M.I.T. Alumni and guests gathered at Vogel's Restaurant in Whiting, Ind., for cocktails and a chicken dinner. After the dinner, Phil expressed the Club's thanks to Edward Ryerson '09, chairman of the board of Inland Steel, for making this trip through the Indiana Harbor Mill possible. Next, Phil introduced William Blake, Inland's manager of community relations. He, in turn, introduced several M.I.T. men now with Inland who acted as guides on the trip, and Leon Walker who organized the mill tour. The group boarded busses provided by Inland. On the tour they inspected the ore unloading and blast furnace areas, the open hearths, the two-mile-long hot strip mill, and the one-and-one-half-mile-long cold strip mill. The entire tour had been carefully planned and progressed on schedule. The guides were most helpful and answered our questions readily. The quality of the tour, which was one of the first to be given at night at the mill, was a tribute to Mr. Blake and the members of Inland's community relations, safety, and plant protection departments.

To Messrs. Ryerson, Blake, and Walker, and the entire Inland Steel staff who made this visit possible, our appreciation and thanks. To Curt Smith for his kind assistance, my personal thanks.—HARLAN H. DAVIS '40, *Secretary*, Precision Rubber Products Corp., 400 West Madison Street, Chicago 6, Ill.

### *The M.I.T. Club of Cincinnati*

The Club had its first social affair of the season on October 4. Some 20 members with their wives and guests enjoyed a dinner at the University Club, followed by a talk by Philip Adams, director of the Cincinnati Art Museum, entitled "The Blue Print of an Art Museum."—ALEXANDER C. BROWN '25, *Secretary*, Emery Industries, Inc., 4300 Carew Tower, Cincinnati 2, Ohio.

### *M.I.T. Club of Duluth*

Executive Vice-president of the Alumni Association, H. E. Lobdell '17, accompanied by R. E. Mattson '26 of St. Paul,

paid his second official visit to the Club on October 15 and 16.

Arthur C. Josephs '28, our local President, entertained us at a dinner supervised by Mrs. Josephs, which I am sure will go a long way toward inducing our executive vice-president to visit us again, before two more years roll around. There were eight of us present, including Mr. Lobdell, R. E. Mattson '26, Leland Clapper '09, D. H. Radford '12, A. C. Josephs '28, J. C. Hunner '32, D. M. Chisholm, 10-44, and C. D. Steele '08.

There are quite a number of graduates in this district, but the task of getting them together at one time has met with considerable difficulty. It is our hope that we can induce a much larger number to turn out for our next meeting. Our list of other graduates in this locality, from whom we should like to hear, are: A. B. Garnich '21 and Lyman Bretting '25, Ashland, Wis.; S. B. Copeland '11, Cloquet, Minn.; P. C. Hitchcock '27, Hibbing, Minn.; E. A. Hurd, 6-46, Y. G. Hendrickson '51, and C. E. Maki '51, Virginia, Minn.; A. J. Erickson '51, Chisholm, Minn.; and from Duluth, W. C. Lounsbury '03, L. P. d'Autremont '10, C. R. Bailey '23, C. B. Myers '25, N. H. Peyton '39, and P. N. Starin '50.—CARROLL D. STEELE '08, *Secretary*, 408-412 West First Street, Duluth 2, Minn.

### *New Haven County M.I.T. Club*

The 1950-1951 season was brought to a successful conclusion at the annual outing at the Riversea Inn in Old Saybrook on June 16. Free beer andchowder encouraged the afternoon activities which consisted of golf, tennis, and bridge. When the games were over we had to decide between steak and lobster. (Those who couldn't decide went home.) Our splendid meal, accompanied by quips and comments from Al Libbey '26 (whom the Club is very glad to see back) was enjoyed by all, and we turned to the business of the meeting. Prizes for the afternoon's contests went to Mrs. Herbert Dean and Mrs. Roger Purcell for bridge, to Cliff Lytle '26 and Jack Purinton '41 for tennis, and to Stan Timmerman, 6-45, and Dick Maconi, 2-44, for golf. The secretary's and treasurer's reports were read and accepted.

Present with their wives and/or guests were: Herbert Dean '06, Alan Dana '15, Steve Metcalfe '23, Walter Weeks '24, Al Libbey '26, Larry Grew '27, Gerald Yudkin '27, Roger Purcell '28, Frank Nettleton '30, Fred Brooks '31, Philip Dreissigacker '37, Charles Healey '37, Cliff Lytle '37, Win Townner '38, Ray Edwards, Jr., '39, John Purinton '41, R. C. Maconi, 2-44, Stan Timmerman, 6-45, David Black, Jr., 6-46, John Bateman, 6-46, Les Robb '47, Dave Finnegan '48, and Bob Bascom '50.

The Club's newly-elected officers for 1951-1952 are: Fred Brooks '31, President; Dick Maconi, 2-44, Vice-president; Jack Purinton '41, Treasurer; and David G. Black, Jr., 6-46, Secretary.

The Club was fortunate to hear Professor Barnett F. Dodge '17, chairman of the Department of Chemical Engineering, Yale University, at the October 17 meeting. Professor Dodge related his experiences and impressions while on a Fulbright fellowship in France and as a member of an E.S.S. commission created by the Army to act as advisers on engineering education in Japan. New Haven's Hof-Brau Haus provided the setting for the meeting.

The following were present: Messrs. W. G. Bent '05, Al Blank '37, Donald Bly '50, Fred Brooks '31, D. C. Chase '47, Vernon Cole '21, Bob Cooper-Smith, 2-44, A. S. Dana '15, B. F. Dodge '17, Phil Dreissigacker '37, Ray D. Edwards, Jr., '39, C. J. Farist '19, M. L. Fenton '30, Bob Gardner, 6-46, Larry Grew '27, Jon Gunnarsson '30, Percy Harvey '28, Fred Kurzweil, Jr., '50, Al Libbey '26, John A. Livingston '41, Cliff Lytle '37, G. Vincent Maconi '15, R. C. Maconi, 2-44, Frank Nettleton '30, F. G. Purinton '15, Jack Purinton '41, R. W. Purcell '28, L. E. Robb '47, W. D. Robertson '42, Milton Robins '48, Win Townner '32, P. T. Wilson '28, and Marshall Wellington '16.—DAVID G. BLACK, Jr., 6-46, *Secretary*, R.F.D. Number 2, Bethany, New Haven 15, Conn.

### *The M.I.T. Club of New York*

The 1951 season got off to its best start in years at the fall smoker on October 3. Ruppert's Brewery was overflowing with good people (378 of them), good beer, and good cheer. We started at 5:30 P.M., with almost everyone there before 6:00 P.M. Tables had been set up for groups who visited friends of last year and previous years. We broke up at 7:30 P.M. in time to get home for a late dinner. Bernie Nelson '35 was chairman and is to be congratulated on a good job well done.

Our next affair is the steak-stein dinner to be held on November 1. We have hired a caterer who guarantees to supply all the genuine beefsteak we can eat. This will be washed down with all the beer we want. Our annual stein will be given out to all members present. The committee has arranged for some stag entertainment which will be in the best tradition of a stag party.—RALPH C. WILTS '41, *Secretary*, American Blower Corporation, 50 West 40th Street, New York 18, N.Y.

### *M.I.T. Club of Southern California*

The fall activities started well with the second meeting of the Governors at the Elks Club on the west side of West-



lake Park. All Alumni, both visiting and local, are urged to mark this luncheon date—the first Wednesday in each month—and arrive at 11:45 A.M. to become an active part of a growing organization. Twenty more class secretaries are needed, scattered from 1912 on. This is an opportunity to become acquainted and work up some good class reunions at meetings.

By the time this is read, the address of Karl T. Compton on "Present Trends of Science" will be history but it is not too late to read the October 20th issue of the *Saturday Evening Post*. The older Alumni will say "Tech was never like this."

With deep regret we announce the passing of Frank H. Merrill '93, President of the Los Angeles Soap Company. His help with the 1946 and 1951 directories and his continuous interest in the Club leaves a warm memory in the hearts of the officers, both present and past.

Hobaica '47 writes: "Thanks very much for your letter of welcome. It was a very pleasant first impression of the M.I.T. Club of Southern California." Accompanying was a check for his dues, directory, and a gift of \$7.00. A hearty invitation is extended to Hobaica and any other Alumni just arriving to attend the monthly meeting of governors as the guest of the Club. Another great opportunity for all Alumni in this area and along the Pacific Coast will be on January 26, when the Institute sends out a group of scientists and technicians to present "Frontiers of Science." It is hoped that attendance from other clubs along the coast and inland will result in a better acquaintance and the framework for joint future achievements.

After a rather brief sojourn, James '15 has left for six months in Lima, Peru. One of his recent jobs was at Eniwetok Atoll in the Marshall Islands in interesting and original designs for test buildings and shelters. He writes: "I can tell you how to build an atomic bomb shelter but hope you won't ever need it."

The number of Alumni who have paid 1951 dues is getting up to twice that of 1950, but there are many who have received the 1951 directory and have not recognized the efforts of those who made it possible—by advertisements, gifts, and work. We are hoping that the Club will be of such service that many more Alumni will become active. The opportunity is taken to thank all who have helped so much in 1951 in the completion of a most excellent directory of the 1,200 Alumni in this area, and the many efforts of all the officers, governors, and class secretaries in advancing the Club to its present high level of both finances and membership. It has been a steady combined effort. The official force wish all the Alumni in this area a Merry Christmas and a peaceful New Year.—HIRAM E. BEEBE '10, Secretary, 1847 North Wilcox Avenue, Hollywood 28, Calif. (Telephone: Granite 9572)

## CLASS NOTES

### • 1885 •

The '85 men now living are: F. E. Bedlow, A. K. Hunt, J. L. Kimball, H. G. Pratt, G. P. Vanier, C. M. Wilder, and Erastus Worthington. Worthington, who was 87 last December, still carries on his engineering business, but a young partner now does the outside work. All the others have retired, and, as far as I know, are reasonably well, except Pratt who is ill. One '85 man is 86 years old, five are 87, and one, 89. I don't happen to know the age of one other.

Pratt was our first class president, and about 15 years ago was re-elected, and still is. Two "specials" assigned to '85 are still living, as far as I know. One is Richard Lull, (B.S., M.S., M.A., Ph.D., Sc.D.), in New Haven, who is 84. He is a retired professor of Yale. He wrote me in April, 1949, to say that he was a daily attendant at the Peabody Museum in New Haven, engaged in paleontological research. The other is Eliza Prentiss Huntington, who is nearly 94.

I am sorry to have to announce the decease of a classmate—Hugh MacRae, born March 30, 1865, in Carbondale, N.C.; died October 20th in Wilmington, N.C., after several months of a serious heart ailment.

After graduating from Technology, he mined mica for three years in the western part of North Carolina. Later he became president of the Linville Company, which had for its purpose the building of a summer resort on Grandfather Mountain. He also built up some resorts in two other localities. He combined the local gas company with the Seacoast Railroad and the Wilmington Street Railway to form the Tide Water Power Company. Soon after that he electrified the railroad, built Lumina, and developed Wrightsville Beach, said to be one of the best beach resorts in the South today. In those days Wilmington was so beset with malaria in the summer months that people refused to reside further east than 17th Street, but MacRae spent thousands of dollars draining the lands between Wilmington and Wrightsville Beach, then developed the Winter Park subdivision and successfully proved that it was healthy to live in that portion of the county.

About 1895 he was president and manager of the Wilmington Cotton Mills. A few years later he formed the Consolidated Railway Light and Power Company, which took in the existing gas, street railway, and power companies. He put in the first steam turbine in the southern states; and was interested in the development of coal mines in southwest Virginia. He founded a syndicate to build one of the first hydroelectric power plants in the South, near Rockingham, N.C.

About 1905 he undertook to develop the farm and agricultural interests around Wilmington and areas of suburban real estate. The development of agriculture led to the establishment of farm colonies,

of which several were started with different nationalities then permitted to come into the United States under the immigration laws. Castle Hayne is now a prosperous rural community and St. Helen is a fairly good second.

For about 25 years, Hugh MacRae was interested in the development of certain branches of animal husbandry in the southeastern part of North Carolina. Finally interest focused on a program for the economical feeding of dairy cattle. By bringing together bits of usable and valuable information from a number of states and from different countries, a system of continuous grazing on annual crops was evolved. While this was meant to be self-supporting, it was not primarily a money-making project but an effort to benefit MacRae's native state. On the outside of the pamphlet which he published, setting forth the results of his experience, appear these words: "The South will come into its own when its fields are green in winter." In one letter he said, "After being interested in various matters, I have come to the conclusion that farming is the basic activity of the world, and it is the most neglected."

To sum up, he was evidently a man of ability, active in many fields, keenly interested in the welfare of his state and of the South, respected and admired by those who knew him.

I want to know the state of your health. Good, I hope. Let me hear from you. Good luck and best wishes.—ARTHUR K. HUNT, Secretary, Longwood Towers, Brookline 46, Mass.

### • 1886 •

No word has been received from living members of '86 since July, and the treasury stands at \$9.87 at this writing, October 18th. The first of the 1951-1952 council meetings were in November, and the Secretary's anticipated expenditures during the season will probably amount to \$40 or more. Some of you fellows who have been and are receiving *The Review* without subscribing to it had better put your hands in your pockets and send along the wherewithal to grease the wheels of the Secretary's mill; they are becoming rusty.

While the above was waiting to be typed, word came of the death on October 7 of Jim Duff of chalk-throwing fame. Jim has been a great help to the Secretary, both in contributing his share and more to the treasury and also to the class notes. James C. Duff was born in Boston, February 13, 1863. He graduated from Boston grammar and high schools and entered M.I.T. with the Class of '86. During his course at the Institute, and for some time afterward, he acted as reporter on the *Boston Herald*, covering M.I.T. events and general news on scientific subjects. After graduation, he traveled extensively in Europe and South America, receiving his Ph.D. from the University of Berlin in 1902. He was at one time technical editor and chemist to *The National Provisioner*; he also served as chemist with the city of New York in the health and fire departments. Among his publications were articles on "Packing House By-products," "Something about Oil," and

the "Cottonseed Industry," he being the original promoter in the making of edible cottonseed oil from Egyptian cottonseed. He was a charter member of the Technology Club of New York, where he lived for a number of years, also having quarters at the Engineers Club. Among his other services he was a member of the faculty of the New York School of Pharmacy, teaching in the department of foods and drugs at Columbia University. After his retirement he was connected with the Electro Sun Company of New York City for six or seven years. His health had not been good for a number of years and he had been confined to his home a great part of the time.

I wonder how many '86 men will recall the irrepressible firm of Duff and Doe and their unerring accuracy with chalk in Professor Pickering's class, sometimes even employing a blackboard eraser if the occasion was propitious. Jim refers to these escapades in his notes, and however much the recipients of these courtesies may have objected to the treatment, it is evident that the principals themselves got much enjoyment out of the game. The Secretary remembers being at one time a target of the firing squad, receiving a bull's-eye in the middle of his back and not being particularly pleased thereby. Well, boys will be boys! — ARTHUR T. CHASE, *Secretary*, Post Office Box 4, Island Creek, Mass.

## • 1892 •

It is the sad duty of the Secretary to record the deaths of four of our classmates. A late notice came in of the death of James W. G. Walker at his home in East Brownfield, Maine, on November 2, 1950. Walker was with us for two or three years in Course I.

John G. Morse died at his home, Ripley Hill Road, Concord, Mass., on March 30. He also was with us for two or three years in Course I. During most of his career, for 46 years, he was in the inspection department of the Associated Factory Mutual Fire Insurance Companies of Boston. He was a member of the Concord Antiquarian Society and of the Essex Institute of Salem. In 1899 he was married to Julie Blakely who survives him. He is also survived by a daughter, Edith Morse Palmer, a son, John Edward Morse, and several grandchildren.

Walter T. Littlefield died at his home, Summer Street, Somerville, Mass., on September 23. He was with us in Course IV for two or three years. He is survived by his wife, Mrs. Alice M. Littlefield, a brother, and a sister.

William E. Scales died on April 3 at his home in Jamaica, Long Island, N.Y. He was with us for a little more than a year, and members of Company B, the Tech Battalion, will remember him as one of their lieutenants. During the larger part of his career he was connected with the Giant Portland Cement Company as district sales manager and special representative. He is survived by his wife, two sons — John G. Scales and Richard D. Scales — and a number of grandchildren. — CHARLES E. FULLER, *Secretary*, Box 84, Wellesley 81, Mass.

## • 1893 •

Frank Henry Merrill, who graduated with our Class from the Course in Chemical Engineering, died in Los Angeles on October 12. From 1893 to 1897 he was employed as chemical engineer with Jobbins and Ruymbeke, in charge of the erection and operation of new plants for the recovery and refining of glycerin. In 1897 he became associated with the Los Angeles Soap Company, with which concern he was actively engaged until the time of his death, having been president of the company since 1928. He was also president of the California Rendering Company, the White King Soap Company, and the Copra Oil and Meal Company, Ltd.

Merrill, who was reputed to be one of the leading soap chemists of the world, discovered the presence of trimethylene in distilling glycerin, and in 1918 developed the first satisfactory granulated soap for use in electric washing machines. He was one of the pioneers in establishing plans for profit sharing with company employees. He was a member of the American Institute of Chemical Engineers; the American Chemical Society; the University Club of Los Angeles; and the Flintridge Country Club.

Born in Newburyport, Mass., May 1, 1871, he married Grace Carver Johnson November 28, 1894. He is survived by their three children — Paul C. Merrill '22 of San Marino; Willis H. Merrill of Long Beach; Ruth E. Merrill of Los Angeles — and six grandchildren.

Philip E. Perry who was associated with our Class in the Course of Civil Engineering, died at his home in Lexington, Mass., September 30. Following several years as a teacher in the Lexington High School, he taught manual training and mechanical drawing at both the Weston and Bedford high schools, until his retirement in 1938. He was born, October 28, 1868, in Portland, Maine, but had lived in Lexington for 50 years, and was one of the organizers of the Lexington Children's Museum.

He was a member of the Railroad Enthusiasts Club, and had been a member of the Lexington Field and Garden Club. He is survived by his wife, the former Marion Woodward; a son, Robert W. Perry; and a daughter, Elinor Perry. — FREDERIC H. KEYES, *Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 38 Chauncy Street, Boston 11, Mass.

## • 1894 •

Professor Henry B. Dates, who for many years was head of electrical engineering at Case School of Applied Science, later renamed Case Institute of Technology, at Cleveland, and who retired several years ago, has been reported by his daughter as living at 1894 Broadstone Road, Grosse Pointe Woods, Mich. Those of us who knew him in student days and who have followed his successful career as a teacher and engineer will be glad to know where he is now spending his years of retirement. If he happens to see this item, it is hoped that he will give the Secretary a somewhat fuller account

of his recent activities, for it is certain that if health has permitted he has been doing useful and interesting things.

Another man whose career has been one of varied activities in several fields, but especially in business as president or chairman of the board of the Kimberly-Clark Company of Neenah, Wis., has again betaken himself to his winter home at Tryon, N.C. Jim Kimberly has always been one of our most loyal class members, although he was early forced by family matters to take over business responsibilities in the company which was founded by his father, and so never completed his course at the Institute. But he became a Captain of Industry nonetheless, and his company has made a fine record. His sons, who also came to Technology, have carried on with him in the businesses of which they have been the leaders. A note from Jim telling more of his activities in recent years would be much appreciated.

A clipping from the Taunton, Mass., *Gazette*, of August 31, brought the sad news of the death of Howard Sydney Reynolds, at the age of 79. The facts stated in the clipping are as follows: "Howard Sydney Reynolds, 79, of Highland road, husband of Bessie A. (Shaw) Reynolds, died . . . at his Lakeville farm. He was born in Randolph, the son of William Franklin and May Etta (Mann) Reynolds. He was a graduate of Thayer Academy, and received a bachelor's degree from M.I.T. Reynolds was a research worker in electric power control in South America, where he was awarded numerous citations on electric power development. At one time he was associated as an engineer with Electric Bond & Share of New York, and was a vice-president of Appalachian Power, which is a subsidiary of Electric Bond & Share. He was formerly affiliated with Stone & Webster of Boston in his active days. Reynolds retired from active business in 1933 to his Lakeville farm where he worked until the time of his death. He served for one term as a Town of Lakeville selectman. He leaves his wife, and a son Shaw H. Reynolds, of Lakeville." We remember him as a quiet but friendly fellow-student, who graduated in Course VI, and soon became absorbed in professional work. The sympathy of the Class is extended to his widow and his son. — SAMUEL C. PRESCOTT, *Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass.

## • 1895 •

It is inspiring to learn of the establishing of a trust fund by our Samuel P. Hunt in the amount of \$500,000, to be devoted to "worthy public, charitable, religious or educational organizations established under the laws of the United States or any of the states comprising it." This charitable trust was announced by the president of the Merchants National Bank of Manchester, N.H., who has been made a trustee. Sam Hunt had this in mind for the past two years, and in establishing the trust at this time (September 1951) fulfills his desire to have various organizations enjoy the benefits of his estate during his lifetime. The articles establishing the Hunt Foundation direct the trustees to use the interest from the investments,



\$25,000 per year for the purpose stated previously.

Sam was born in Manchester 79 years ago; his father was Judge Nathan P. Hunt who died in 1931. Sam graduated from Dartmouth in 1893 before coming to Technology. In 1895 he received the degrees of electrical and chemical engineering, and then took a year's post-graduate course in Mechanical Engineering, Mathematics, and Geology. Following graduation he worked for the American Telephone and Telegraph Company in New York, Pittsburgh, Cleveland, and Buffalo for about eight years and then followed his connection as engineer of the Binghamton Light, Heat and Power Company. In 1907 he returned to his native town and became assistant manager of the Manchester Traction Light and Power Company. During World War I he went to Washington as an executive of the national gun factory, and then served as electrical engineering consultant with the Electric Boat Company at Groton, Conn., and then with the Barstow Engineering Company of New York.

Finally Sam Hunt decided to go back to school, and he took a course at the Harvard School of Business Administration. In 1925 he returned to Manchester to be the engineer for the Public Service Company, from which he retired in 1935, still taking part in many business ventures. Sam is a director of the Merchants National Bank, a trustee of the Merchants Saving Bank, a director and clerk of the New Hampshire Insurance Company, a director of the Manchester Gas Company, and of the Northeastern Engineering Company, and a director of Resin Research, Inc. Sam has no children, and Mrs. Hunt passed away in 1949.

We learn from the Alumni Association that Frank Munroe Brininstool passed away October 18, 1950. Frank attended the University of Michigan, and was with our Class at M.I.T. for the year 1891-1892. His business activities centered in paint manufacturing and he was located in California, his adopted state. His home address was 760 Holladay Road, Pasadena, Calif. Stephen H. Plum, 2nd, has changed his address to 37 Mt. Kemble Road, Morristown, N.J. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

### • 1896 •

Seasons greetings to you all, and may the coming months find you in reinforced armor for the current conflicts, including general political unrest and local political problems.

A full and rather personal letter from Charles Hyde gives a graphic picture of how devoted his entire family were to Charlie and Mrs. Hyde. Her passing was entirely unexpected, as she had enjoyed several auto trips just previous to her sudden heart attack. His reference to her character, quoted from his letter, "Margherite was so beautiful, brave, thoughtful, generous, and noble, it is terribly hard to get adjusted to her going," shows what a tragedy has come into the sunset of his successful life. I know I express the feel-

the admiration and love we have always cherished, and extend our deepest sympathy in his hour of trial.

Quoted here from the Lawrence, Mass., *Tribune*, is the following account of one of our classmates: "John Ashton, designer of a number of prominent buildings in Lawrence and throughout New England, celebrated his 90th birthday at his home, 10 Buckingham road, North Andover. Born in Staley Bridge, Yorkshire, England in 1861, Mr. Ashton came to this country when he was fourteen years old and settled in Lawrence the same year. Before taking up the study of architecture, Mr. Ashton was a mechanic, having learned the trade under Joseph James, then master mechanic at the Pacific mills. After working as a mechanic for several years, he joined the Mackay Sewing Machine Company organization, which is now part of the United Shoe Machinery Corporation of Beverly. It was during this time that he turned his interest to architecture, finally giving up his post as a mechanic and entering . . . Technology for a special course in architecture. Opening his office in this city in 1893 in the Slater building . . . he remained in business in Lawrence until his retirement in June, 1943. In 1898 Mr. Ashton designed the Blakeley building for Richard Barlow and when the building was completed, he moved his office into the new structure. . . . The office founded by John Ashton has designed all types of buildings to meet diversified purposes. One of the outstanding efforts was in laying out the plans for the Eagle-Tribune Publishing Company building, rated one of the finest newspaper plants in New England. Among the buildings which the firm has designed and supervised in Lawrence are the Tarbox school, Lawrence high school, the Y.W.C.A. building, and the Hood, Breen, Leonard and Lawlor schools. In addition, plans were drawn for the Portsmouth High school, Watertown Junior High school, Framingham Town hall and several schools in Beverly. . . . Mr. Ashton married the former Harriet Compton of North Andover in St. Petersburg, Fla., in 1947 and they have resided in the suburban town for the past four years."

Following are excerpts from a note received from Ruth A. Phillips, former Review Class Notes Editor, who left us for a new assignment (matrimony): "Working on The Review certainly has been a satisfying experience and I have always enjoyed the pleasantness of the people and the work involved. A mere thank-you seems very inadequate, but I hope you will know how sincerely and gratefully I say it at this time. My best wishes to the Class of '96." — JOHN A. ROCKWELL, *Secretary*, 24 Garden Street, Cambridge 38, Mass. FREDERICK W. DAMON, *Assistant Secretary*, 275 Broadway, Arlington 74, Mass.

### • 1897 •

Your Secretary has just been advised of the death on September 11, 1950, of Conrad H. Slade, Course IV, of Los Angeles, Calif. Further particulars are unavailable.

Again we wish to state what we have already said in the November issue of The

Review. How do you wish to observe the 55th anniversary of our graduation? Shall we have a reunion of several days' duration, shall we have a reunion lasting but one day, or shall we have just a class dinner? Remember that Alumni Day, with the noonday luncheon at the Institute and the Alumni Banquet in the evening at the Statler Hotel, is now being observed on a Monday. Please advise your Secretary at once, if you have not already done so, as to your preference in this matter. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass.

### • 1899 •

Arthur H. Herschel, VI, formerly located at Montclair, N.J., is now located at 99 Morris Avenue, Springfield, N.J.

Miss Henrietta C. Dozier, whose last address was 2358 Forbes Street, Jacksonville, Fla., died about 10 years ago, according to information received by the Alumni Secretary.

Edith M. Packard, wife of Edwin A. Packard, died at her home in Yonkers on August 19, following a long illness. She was a native of Needham, Mass., where she was accustomed to spend her summers until recently. Our sympathies are extended to you, Ed. — BURT R. RICKARDS, *Secretary*, 381 State Street, Albany, N.Y. MILES S. RICHMOND, *Assistant Secretary*, 201 Devonshire Street, Boston 10, Mass.

### • 1900 •

Last month's notes recorded the recent and sudden death of Chester Richardson. We can now give more information regarding his career. Among the high lights of his career were the following: 1905-1907 he was employed by the Grand Trunk Pacific Railway on a survey preliminary to location. This took him through British Columbia and the entire northwest of Canada. From 1908-1911 he worked with the Boston Elevated Railway on the plan and design of the Cambridge subway. From 1900-1917 he served with the Boston Transit Commission on subway planning. The years 1919-1937 were spent with Charles T. Main, Inc., as a structural steel designer. The years 1938-1939 he was with Cleverden, Varney and Pike of Boston doing special flood reconstruction work on bridges damaged in the Berkshires. During World War II he was a structural designing engineer at the Quonset Point, Rhode Island, Naval Air Station. In 1943 he went with Metcalf and Eddy, engineering firm of Boston, where he continued as a structural designer up to the time of his death. Mr. Richardson is survived by his wife, twin daughters, a son, Henry, and three grandchildren.

This first break in the circle of those members of the Class who attended the 50-year reunion of last year, was followed 10 days later by the sudden death of Fred Everett who was stricken in Boston on September 18 while attending a convocation of 33rd degree Masons. We gave a considerable account of Fred's career in these notes in the December, 1950, issue of The Review, on the occasion of a testimonial dinner given him at his retire-

state of New Hampshire. We are adding here a few more notes that have come to our attention: "Mr. Everett received the George S. Bartlett award for outstanding engineering achievement, from the American Society of Highway Officials, American Road Builders' Association and the National Research Council in 1946. He was a member of the executive council of the American Society of Highway Officials for 15 years and served as its president in 1934. The honorary degree of doctor of engineering was conferred on Mr. Everett by the University of New Hampshire in 1946. He was delegate to the International Road Congress in 1930, and also served terms as president and director of the North Atlantic State Highway Officials conference. Mr. Everett was a charter member of the N.H. Society of Engineers, a member of the N.H. Good Roads Association and of the N.H. Society of Newcomen. Long active in the Masonic orders, he was a member of all Masonic bodies and held the 33rd degree."

The Secretary has 16 negatives of candid photographs of groups at last June's reunion at Cotuit, and can obtain prints if anyone desires them. — Harry Morris writes from Washington: "Just a few lines to say we are driving to Dallas, Texas, starting October 15th, and shall fly to Mexico City the 28th for a week of talks and festivities when the mining and geological fraternity of all the Americas gets together for a meeting and fiesta. When we return to Dallas on November 5, we shall start the long trek to southern California where we hope to stay all winter. I am hoping, en route, to visit my old buddy Wiswall who is kingpin at the Green Ranch at Cananea, Sonora; for I haven't seen a real ranch for years and that is one, believe me. Our headquarters for the winter, and I hope into the spring, will be with my sister-in-law, Mrs. M. W. Holt, 707 Wildomar Street, Pacific Palisades, and I should like very much to have any of the Class who are near there drop me a line to see if we can't get together; but we will probably have to wear Technology colors to identify ourselves." — ELBERT G. ALLEN, *Secretary*, 11 Richfield Road, West Newton 65, Mass.

## • 1901 •

Last month I reported the death of Robert Morton of New Jersey. I offer further news of him as reported in a Newark newspaper: "Robert Bass Morton, retired electrical engineer, who did work on the Hudson and Manhattan Railroad tunnels and electrification of the Pennsylvania Railroad and its affiliates, died Saturday, May 19 at his home after a long illness. He was 73. He was associated with Gibbs and Hill, New York, consulting engineers who did the electrification work. In the early 1900's he was employed by L. B. Stillwell Co., New York, who constructed the Hudson tubes. Born in Randolph, Vt., he was graduated *cum laude* from the University of Vermont in 1899 and received a special engineering degree two years later at M.I.T. He lived in New York before moving to Upper Montclair, N.J. 44 years ago. Mr. Morton, who specialized in power distribution, began his

1901, and then associated with the Manhattan Elevated Railway Co. and the Interboro Rapid Transit system. In 1906 he joined the Stillwell firm and remained there until the firm was dissolved in 1917. During World War I Mr. Morton was an appraiser of aircraft production for the government. In 1923 he joined Gibbs and Hill and remained there until he retired in 1944. He wrote many papers on power distribution. He was a fellow of the American Institute of Electrical Engineers and a former member of the Lake Mohawk Country Club. He is survived by his wife, a daughter, a son and a grandson."

From class letters received last spring, I get the following news, this being the first opportunity for its presentation: Grace MacLeod, V: "Retired but serving as consultant on a program of research at Teachers College, Columbia University, which is being carried on in co-operation with the Bureau of Human Nutrition and Home Economics, U.S. Department of Agriculture. We are determining the energy expenditure of children in their various activities, using a respiration chamber and several different forms of respiration apparatus, with the object of setting up better standards for the energy requirements of children." W. Cornell Appleton, IV, Boston, says: "Having a wonderful time in the practice of my profession." Anthony Peters, I, retired, living in Westwood, Mass.: "Moved up here from Boston in April. What a job! But it's worth it." James H. Carr, II, Cambridge, Mass., Department of the Army, Corps of Engineers, New England Division: "Retired; called back for emergency work." Warren G. Chapman, VI, Groton, Conn.: "Retired October, 1949, after 33 years with the Electric Boat Company, One eye left from which cataract has been extracted. Otherwise O.K. My beard may call me to mind with some of the Class. Am able to read and get around fairly well in familiar surroundings." Alfred Nutter, I, of Pittsburgh, Pa., tells us that he has retired. Frank Holmes, V, of Amherst, N.H., who expected to be at the 50th reunion, underwent a serious operation in the spring. A letter from his daughter stated that he was recovering successfully but would not be strong enough to be with us. We missed him as he was very regular at previous reunions. — THEODORE H. TAFT, *Secretary*, East Jaffrey, N.H. WILLARD W. DOW, *Assistant Secretary*, 287 Oakland Street, Wellesley Hills 82, Mass.

## • 1902 •

In the latter part of September, the chairmen of the various reunion committees met to check on the progress of the plans. Hunter, Sawyer, and Williams were unable to be present but Robbie was down from Brunswick, Maine, and gave a report of class finances. All seems to be going well. Each member has by this time received a request for a sketch of his career and a postal asking if he is likely to come next June or, if he is uncertain, whether he would wish to have further news sent from time to time. To date 66 replies have been received and 54 wish

indicated that they are likely to come. Several of our western members have been heard from. McKechnie of Carlsbad, N.M. and Kenneth Grant, Los Angeles, expect to be present; Eastwood of the University of Washington, Seattle, Desloge of Santa Barbara, Walter Putnam, and Lombard of Pasadena, answered that as of date they do not expect to join us but there is still time to convince them.

We learn that Robinson has been recently elected a trustee of the National Universalist Church of America for a term of four years. His specific duty will be to serve as chairman of the department of finance and investments. He has previously served as president of the Connecticut Universalist Convention for five years while a resident of Fairfield, Maine, and more lately as treasurer of the Universalist Church of Maine.

Henry Saylor has recently been elected to fellowship in the American Institute of Architects thus receiving one of the highest honors that the professional society confers, one that is conferred each year on a selected group of outstanding American architects who have achieved professional prominence in design, public service, or in service to the profession.

Charles Tolman writes that his field of work has been mechanical and chemical engineering. He is a Fellow of the American Society of Mechanical Engineers, a member of the Illuminating Engineering Society, a life member of the American Institute of Electrical Engineers, and a member of the National Safety Council of which he is past president, and the Pan-American Association of Ophthalmology. Tolman has done a large amount of original work and has 44 United States patents to his credit. The most interesting part of his activities is that which his letter describes as quoted: "Much of my work has been administrative, both engineering and business, and during the past 10 years the greater part of my consulting work has been of an administrative character in connection with the prevention of blindness. This began with an engagement by the National Society for the Prevention of Blindness, to investigate the conditions and practices in industrial plants with respect to eye health and eye protection. This led to the organization of an educational program by mail which has, to an extent, become international and has been used in the formulation of industrial health codes. In connection with this program I learned the need for instruction in the industrial aspects of ophthalmology in medical schools, and initiated and developed a course in the subject which is now given in some 16 American medical schools, and in some 10 or 12 foreign countries. More recently, during the past three years I have given a great deal of attention to the subject of prevention of blindness from glaucoma. It seemed obvious that an instrument was needed to enable the practitioner to discover this disease in its early stage, in which stage the only indication is the elevation of pressure in the eyeball. I designed an instrument for this purpose and it is in extensive use. This program has developed very rapidly and has also be-



come international in scope. I am very much interested in this work because I originally wanted to go into medicine but family fortunes didn't permit the long and costly preparatory period. My next choice was pure physics, but there again the earning capacity was too little, and the development of it too long, so in a sense I am now, for the most part, giving my attention to the field in which I was primarily interested."

Our Class has lost another member in the death of Dr. William C. Peters of Bangor, Maine, who died in Boston, September 30th. He studied Biology at the Institute and then attended Tufts Medical School where he was later assistant in microscopical anatomy for three years and then instructor in operative surgery for a year. He then returned to his native Maine and settled in Bangor. In 1904 he was appointed the first orthopedic surgeon on the staff of the Eastern Maine General Hospital and he did pioneer work in the surrounding district. In 1917, Peters was commissioned major in the Army Medical Corps where he practiced orthopedic surgery at Camp Devens. Later he was transferred to the orthopedic department of the surgeon general's office in Washington and eventually supervised the orthopedic work in all the Army camps except those on the Pacific Coast. He remained in the service for four months after the Armistice, retiring with the rank of lieutenant-colonel. Dr. Peters returned to practice his profession in Bangor, and found time to take an active part in community medical projects and civic affairs. A few years ago he returned to Boston for medical treatment and resided here until his death. He is survived by his widow, the former Kate Benson Davis.—BURTON G. PHILBRICK, *Secretary*. 246 Stuart Street, Boston 16, Mass.

## • 1905 •

You can lay the absence of class notes in the November issue to the father of the bride, daughter number four, Carol, having been married to Hazen E. Bickford of Center Harbor, N.H., on September 15, just a few days before the deadline on class notes. You wouldn't think such a common occurrence would cause your Secretary to be remiss on such a matter, but daughter number one was on from Virginia with grandchildren numbers one and two, and we're just getting back to normalcy.

It's rather late to report on our 46th reunion on June 15, 16, 17. Call it rather an ingathering of confirmed reunioners at East Bay Lodge, Osterville, Mass. Present were the Barriers, Balls, Prescotts, Files, Lovejoys; also Gil Joslin, Sid Strickland, Harry Donald, Gib Tower, and the Secretary (Mrs. Goldthwait was unable to attend because of sickness). One of the high lights was the appearance of Frank Elliott of St. Louis, accompanied by a business associate, Howard Pecher. Old Sol was conspicuous by his absence, which led to an increase in indoor gab fests, contract, and so on. Between showers, we went across the Cape to Ed Barrier's now-permanent home at Barnstable, where we again enjoyed Ed and Isa's hospitality. Elliott had not attended a re-

union for many years, had fairly recently had an operation for cataract on both eyes, seemed hale and hearty, and still enjoys his business trips all over the U.S.A. He is of the firm of Skinner and Kennedy Company of St. Louis, makers of calendars and souvenirs in industrial lines. At Alumni Day at Cambridge on June 11 were Mr. and Mrs. Fisher, Mr. and Mrs. Harold Mitchell, Mr. and Mrs. Babcock, Mr. and Mrs. Secretary, Bob McLean, Frank Chesterman, Harry Charlesworth, Gil Joslin, and Henry Buff. Male members, as above, attended the banquet in the evening.

Andy Fisher reports the birth of another grandson, Alan Dale Fisher, born on April 30, bringing his total to six, three boys and three girls. Daughter Edith, who has won national recognition in the field of religious education of children, has just had a book published by the Beacon Press. Ros Davis reports that Ski Lombard is president of the Institute of Applied Citizenship, 3 East 45th Street, New York. This is a "Massachusetts Trust to Promote American Ideals."

Arthur E. Spencer, III, was given a testimonial at Hotel Manger, Boston, in March in recognition of his retirement after more than 30 years' service with the Massachusetts Department of Public Works. Arthur is a member of the board of assessors in his home town of Foxboro, Mass. Bertrand L. Johnson, III, reports that he will retire shortly after a near lifelong service with the Bureau of Mines.

The Boston Herald of August 1 carries a picture of Percy Goodale with son and grandson at the start of the annual father and son golf tournament at the Winchester (Mass.) Country Club. Percy has played either with a son or grandson, or both, in 30 of the last 31 yearly tournaments. Bobbie Burns wrote in July that he had been laid up for nine months with a virus infection of the nerves at the base of the spine, a very painful ailment affecting his ability to walk and yielding slowly, but surely, to treatment. Fred Poole, VI, address Audubon, N.J., was in Boston during the summer, seemed in excellent health and spirits, and is doing consulting work in Philadelphia. A letter from Frank Webster, II, dated October 12, and mailed at Buenos Aires, Argentina, tells of a long and interesting trip through all South American countries. He saw Jack Flynn at Buenos Aires, and says Jack promised to attend the 50th reunion.

The rest of my story is not quite so pleasant to record. Mrs. Francis J. Chesterman died at Newburyport, Mass., on July 16 after a long illness. I attended the funeral, saw Harry Charlesworth, and assured Frank that the cumulative sympathy of the Class went out to him at this time.

John R. Wall, IV, died at Lynchburg, Va., on May 12, 1942. He went with the New York Telephone Company in 1905, Empire City Subway Company, New York, 1906-1912, and managed the John Wall Estate from 1912 until his death. C. G. Van Brunt, V, died at Schenectady, N.Y., on May 2, aged 81. He served as chemist in the General Electric research laboratory for 41 years until his retirement in 1945. He was a pioneer in microchem-

istry. At a time when such methods were virtually unknown in this country he developed his own tools and technique. Using microchemistry, he laid the foundation for the modern understanding of how electrical currents are transferred in sliding contacts, important in motors and many other kinds of electrical equipment. Colonel F. Chas. Starr, I, died at his home, 8 Plymouth Road, Lexington, Mass., on June 11. After graduation Charlie was an assistant in Course I for two years, taught in Washington, D.C., for six years. In 1914 he was instrumental in the rejuvenation of the M.I.T. Alumni Association of Washington, and reported that every one of the officers was an '05 man. After that we lost track of him, but he was in World War I, returning as colonel. A few years ago he returned to Boston as an executive with the Federal Housing Association.

Captain Ross P. Schlabach, XII, a retired naval officer and vice-president and general manager of the American Shipbuilding Company of Cleveland, died on August 26 at the Naval Hospital, Bethesda, Md. He came to M.I.T. after graduation from Annapolis. His 44 years of service in the U.S. Navy includes a three-year assignment as superintendent of the mechanical division of the Panama Canal at Balboa.

These changes of address are noted: Renshaw Borie, II, from Niagara Falls to 2410 Panama Street, Philadelphia. Professor Chester Allen, I, from Pottsdam, N.Y., to Olivet, Mich. (Post Office Box 195). Fred W. Simonds, I, from Edenton, N.C., to 35 Old Marlboro Road, West Concord, Mass. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston 10. SIDNEY T. STRICKLAND, *Assistant Secretary*, 69 Newbury Street, Boston 16.

## • 1906 •

We have the most unusual letter for the Number 1 item of the December class notes. This letter was from William W. Hosmer, whose address is Post Office Box 195, Field, Ontario, Canada: "Found these two cards (from the Alumni Register) in my mail on return from a short prospecting trip. [Found] lead with a trace of silver, but on old homestead land where the mineral rights were sold to the homesteader. This is no good from the prospector's standpoint, as his take can only be 10 per cent. For the past three years I have been gadding about some 10 or 12 states, plus Ontario. Was in the upper peninsular of Michigan when indications of uranium were found there. Recently bought a piece of land here on the Sturgeon River from which, by rail or river, and lake by outboard and boat, or canoe and paddle, it is possible to go north over the height of land to where the water flow is to the Arctic Ocean. This should be paleological rock area and worth looking at. Some years back, spent three winters with a cousin, Merle C. Hosmer (Colorado School of Mines) reading up everything in the Wooster, Ohio, Public Library on mineralogy, inorganic chemistry, and so on, under his guidance. Through him I picked up a working knowledge of what to look for and may have a chance to make a million yet. Am

only 69 years and 6 months old this week Wednesday [July 18, 1951], and there is always that prospector's slim chance of one to 1,000 — or is it the ratio of one to 10,000? Have teamed up with an old-timer here. He is Henry McCauley of Sturgeon Falls, Ontario, Canada. Harry staked a claim at [the Timmins] gold strike, some 35 years or so back which was sold to the Syndicate for \$40,000 by the man who pulled up his stakes and beat him to the registry office. Harry had neglected to get a renewal of his prospector's license and the delay in filing cost him the claim. Between us, we have all needed equipment from Geiger counter to compass, a light plywood boat, outboard, drills, dynamite, and so on. This year we will only make short trips of about two weeks each, to spots known to Harry that he considers worth another look. Next year we intend going northwest over the divide to an area that has been little explored. Acquired this cabin as a take-off spot nearer to possible metal than the more civilized places to the south. Across the Sturgeon River, 35 yards from the cabin, one may go straight north for many miles, and, except on crossing Route 64, never see a permanent habitation. Am told that not over 6 per cent of Canada has been intensively explored, and I like wilderness.

"Came in here this spring on April 25 and have divided my time between trout fishing, two short prospects, and fixing up the cabin. Later, when the leaves turn, will do some landscape painting. My spot can be reached by highway going west from North Bay, Ontario, 23 miles to Sturgeon Falls on Highway 17 (Trans-Canada Highway) and taking Route 64 (Field Road) north from there for a distance of eight and one-half miles to Mile Post 89 on the C.N.R. Name, Hosmer, on a sign." Hosmer's directions for reaching his cabin were intended for any Course III men who want to be prospectors, but I am sure classmates would be welcome if they wished to look him up.

The Secretary has just received Henry Darling's first letter in connection with the resumption of the Alumni Fund. It is noted that Darling's address is given as Damarin, Wincasset, Maine; the Wincasset should be Wiscasset. As previously reported in this column, Henry is residing in this lovely Maine town since retirement from his position as vice-president of the New England Telephone and Telegraph Company in Boston.

The Secretary notes a change in address for Abe Sherman who now resides at 205 Rye Road, Rochester, 13, N.Y. We will miss Abe from the Boston gatherings, as he was always most faithful in his attendance.

While on the way to Boothbay Harbor on August 28, the Secretary and his wife ran into Harold Young at the New Meadows Inn in Bath, Maine. Harold had been touring in that part of the country to renew association with some of his old haunts, as he originally came from Bristol. The Secretary neglected to ask him his present address which was unfortunate, as the mail was returned from the address recorded in the class files. Harold was

vice-president of the Northern States Power Company at Minneapolis.

The November issue included a reference to the award of the Frank P. Brown Medal of the Franklin Institute, Philadelphia, to Samuel A. Greeley of our Class. The following is taken from the release of the Franklin Institute in connection with this award: "Samuel Arnold Greeley, of Chicago, Illinois, sanitary engineer at U.S. army camps and other government projects, and one of the country's outstanding engineers, has been awarded the Frank P. Brown Medal by The Franklin Institute. . . . Formal presentation of the medal took place at Medal Day ceremonies in the Institute's Franklin Hall on October 17. The Brown Medal, founded in 1938, is awarded to inventors in the building and allied industries. The citation accompanying the medal says the award was made to Mr. Greeley 'for his leadership in the profession of sanitary engineering and his many contributions to knowledge in that field which have particularly improved the welfare of urban populations.' Born in Chicago in 1882, Mr. Greeley graduated from Harvard University in 1903 with an A.B. degree, and in 1906 received the degree of Bachelor of Science in Sanitary Engineering from . . . Technology. For the next five years he was assistant engineer with Hering and Fuller, noted New York sanitary engineers. From 1909 to 1911 he was resident engineer in charge of construction and superintendent in charge of operation of the Milwaukee Refuse Disposal Plant. He later investigated water supply and sewage disposal projects for Caracas, Venezuela, and then returned to this country as assistant engineer with the Chicago Sanitary District. In 1914 he established a practicing firm under the name of Greeley and Hansen, Engineers, Chicago, a firm which specializes in sanitary engineering for municipalities and industries. In the course of his work he has been engaged as consultant by many municipalities in this country and Canada. In addition, his work has taken him to South America, England and the Continent. During World War I, Mr. Greeley was supervising engineer for the construction of Camp Custer, Michigan, and sanitary engineer for U.S. Shipping Board operations on the Pacific Coast, the Northeast Coast and the Great Lakes.

"During the second World War, he served as special consultant to the Construction Division and the Corps of Engineers of the U.S. Army. His firm had charge of the layout and construction of Camp Forrest, Tennessee, and recently was retained by the War Department to report on sewage disposal for the Panama Canal Zone. . . . The recipient of many honors for his work, in 1931 Mr. Greeley wrote with William D. Hatfield a paper on sewage disposal works at Decatur, Illinois, which won for him the Thomas Fitch Rowland Prize and the Rudolph Hering Medal. . . . In 1941 the American Society of Civil Engineers awarded Mr. Greeley its James Laurie Prize for his paper on the sewage disposal project of Buffalo, New York, for its merit as 'A contribution to engineering science.' For the past three years Mr. Greeley has been chairman of a joint group of representa-

tives of the A.S.C.E., the American Bar Association, and six other national technical organizations which have just published a report on fundamental considerations for water and sewage works. Mr. Greeley has held office and served on important committees in many technical societies. . . . Mr. Greeley lives at 206 Chestnut Street, Winnetka, Illinois."

The Secretary has received notice of the death of Mrs. Nathaniel McDonald, who passed away at Sackville, New Brunswick, on June 28. Mrs. McDonald's maiden name was Statira Caldwell and she was listed as taking Course V at the Institute. The record shows that she was at Woodland Park School, Auburndale, in 1919 and later became connected with Lasell Junior College, also in Auburndale. The class record showed her still there in 1936. In 1947 she reported her address changed to Sackville, New Brunswick, Canada, where she resided at the time of her death. — JAMES W. KIDDER, *Secretary*, 215 Crosby Street, Arlington 74, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills 82, Mass.

## • 1907 •

My one and only item of class news for this issue is a brief note from John Frank, dated October 14, from Rome, Italy. John wrote: "I am sojourning in Rome and Florence with my wife and daughter. We stopped in London for a few days and while there I saw our classmate André Kolatschewsky. He is living in Slough, an attractive suburb of London, with his wife, his married son, daughter-in-law, and grandson. [See the November Review.] We are having a grand time. London is terrific, Paris magnificent, but Rome is truly the 'Eternal City.'"

Two important things to remember, men: Our 45-year reunion at Oyster Harbors Club, Osterville, Mass., June 20-22, 1952; and our contribution to the M.I.T. Alumni Fund. Both matters call for your favorable consideration. — BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. PHILIP B. WALKER, *Assistant Secretary*, 18 Summit Street, Whitinsville, Mass.

## • 1909 •

We have learned that Harold W. Paine, X, has retired from the E. I. du Pont de Nemours and Company after having devoted 36 years to plastics research, most of it in the company's laboratories. From 1929 to 1950, he was assistant director and then director of the Du Pont plastics laboratory at Arlington, N.J., and at the time of his retirement was assistant to the director of the polychemicals department at the Experimental Station at Wilmington, Del. Among his major activities was the development of methods for using plastic in automotive safety glass and the development of Lucite and nylon molding powder. He graduated from Brown University and received his degree at the Institute in Chemical Engineering. He is a member of the American Association for the Advancement of Science and the New York Academy of Science. From South Yarmouth, Mass., he writes us: "So far, retirement has been most enjoyable. The



most amazing fact is that I never seem to find time to do all that I wish to do. For example, I am writing this while watching a television news program. Have three or perhaps four hobbies, these being contract bridge, golf, swimming, and painting landscapes, so you see time is of the essence. I am also a baseball, football, and hockey fan, so have far too much to tend to."

We have just learned that Andrew L. Matte, VI, has retired after something like 33 years of service with the American Telephone and Telegraph Company and the Bell Telephone Laboratories. After graduating from the Institute, Andrew returned in 1912 to take graduate work. In 1918, after five years with the Detroit United Railways, he joined the development and research division of the American Telephone and Telegraph Company and transferred to the Laboratories in 1934 with the development and research division. His life work has been concerned with carrier telegraph systems in which he is a recognized authority and holds 19 patents. He has been called into consultation by the government and various railroads, and his developments have been used by the armed forces. He has written a number of professional papers, for one of which he and his coauthor received an A.I.E.E. first prize. He and Mrs. Matte, who was formerly a secretary with the A. T. and T. Company, will continue to live in Summit, N.J., and Andrew has become an associate professor of electrical engineering at Brooklyn Polytechnic Institute.

We were all shocked and grieved to learn of the death of Garnett Joslin, III, on September 20 in Mexico City, following an operation for gall bladder. We asked his wife, Jessie, to send us a sketch of his career and she has done this in a very effective manner: "Immediately after graduation Garnett went to the cobalt region of Canada where he spent several years. His next work was done in Venezuela, where he spent a year and a half for American Metals on an examination for oil and minerals. He returned to California in 1914 and, after some work done in the West, went to Ray Consolidated. In November of 1915 he came to Los Angeles where we were married (Jessie Heber). We were in Ray, Ariz., until March of 1916, when Garnett was called to make an examination and map the geology of a large track of timberland, covering the four states of Oklahoma, Arkansas, Texas and Louisiana and belonging to the Diercks Lumber Company of Kansas City. This work required about 10 months, and before it was finished he was engaged to reopen the Ramshorn Mines in Idaho. The mines had been shut down when silver was demonetized, so we had the interesting experience of reviving a 'ghost town.' Garnett developed electric power by damming the little mountain streams, and by building a flotation mill and aerial tramway; in six years he worked out the major portion of the mines. We went on to New York and after a short time went to Chuquicamata, Chile, where we spent two years with the Chile Copper Company. When we returned to New York, Garnett was sent back to South

America on a year's examination for American Metals. He sailed from New York on Christmas Eve and the following Christmas we landed in San Diego, Calif. It was then that in 1926 he opened an office as consulting engineer in Los Angeles. For 20 years he was very active in mining circles in the Southwest. He was, successively, president of the South West Mining Association, chairman of the Southern California Section of A.I.M.E., and chairman of the Mining Committee of the Los Angeles Chamber of Commerce. In 1946, Garnett accepted a position in Mexico as head of the Compania Metalurgica Mexicana, the Mexican branch of Towne Securities Corporation of New York. He was also, for some years past, an associate member of the firm, Behra-Dolbear Company of New York. The five years we have spent in Mexico have been delightful and interesting. Since all of the company's mines are operated by the American Smelting and Refining Company, Garnett's work was a matter of supervision and policy-making. His death has ended a life that was very full and happy." To us, who are responsible for class affairs, particularly the notes for each month, Garnett was one of our most co-operative members, as a study of past Reviews substantiates. He was also most generous in contributing to the class expense fund. All of us who attended the 40th reunion at Osterville will remember the congenial companionship of both Garnett and Jessie, and we were all most appreciative of their loyalty to the Class in coming such a long distance.

Another good member of the Class, Harold Sharp, I, passed away at his home in North Hollywood, Calif., on September 9 after a long illness. He was born at Nantucket, Mass., in 1887 and prepared for the Institute at the Penn Charter School at Philadelphia and the Boston English High School. While at the Institute he played quarterback on the freshman and sophomore football teams. He was a member of the Civil Engineering Society, the Penn Club, the Musical Clubs, and was leader of the Banjo Club. For a number of years he was connected with Stone and Webster in Boston and later moved to California where he was employed by the Southern California Edison Company developing hydroelectric power. Later he and his older son organized an engineering and construction company at St. Thomas in the Antilles. In 1917 he married Elizabeth Elting and, later, Laura Sharp who survives him. He is also survived by a daughter, Mrs. R. W. Williams, Jr., and two sons, Theodore E. Sharp of Hawaii and Randolph G. Sharp of Boston. Your Review Secretary knew Harold quite well, particularly as a member of the football team. Besides being a good quarterback, he was modest and conscientious at all times. — PAUL M. WISWALL, *Secretary*, 20216 Briarcliff Road, Detroit 21, Mich. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 366 Madison Avenue, New York 17, N.Y.; GEORGE E. WALLIS, Wenham, Mass.

It is with deep regret that I announce the passing of two of our classmates. Carroll Benton sent me a clipping that Arthur L. Stein died August 29, 1951.

The following is the notice of Ralph M. George's death: "Ralph M. George, prominent oil producer, church and civic leader, died at 7 P.M., September 15, 1951, in Bradford Hospital. A native of Clifton Springs, N.Y., Mr. George had resided practically his entire life in this city. He was graduated from Bradford High School, Princeton University and . . . Technology. He taught at MIT for two years returning to Bradford to enter the oil business with his father, the late James George."

The following is from a news release from the American Association of Textile Chemists and Colorists: "The American Association of Textile Chemists and Colorists has announced that it will present its highest award to Raymond W. Jacoby of Ciba Company, Inc. at its annual convention in New York October 17, 18 and 19. The Olney Medal is awarded annually by AATCC for outstanding achievement in the field of textile chemistry and is considered one of the industry's greatest honors. The medal endowed by the Howes Publishing Company has been awarded each year since 1944 as a testimonial to the late Dr. Louis A. Olney of the Lowell Textile Institute in recognition of his lifetime of devotion and multitudinous contributions to this field. Mr. Jacoby was born in Wilkes-Barre, Pennsylvania, and graduated from the local high school there before attending . . . Technology where he received his Bachelor of Science degree in chemical engineering in 1910. From then until 1937 he served with various companies in the textile finishing industry as chemical engineer, superintendent, and manager. Since 1937 he has been connected with Ciba Company, Inc. as technician, research director, branch manager, and department manager. Among his many activities has been the presentation of technical papers on textile processing, printing, and dyeing at meetings and conventions of the American Association of Textile Chemists and Colorists, and the Canadian Association of Textile Colorists and Chemists. Besides lecturing on textile processing at several colleges and textile institutions, he has furnished a constant flow of new technical material for publication in a number of trade magazines and papers. He has been granted five U. S. Patents in the field of textile dyeing and processing. Mr. Jacoby has distinguished himself by his untiring efforts to bring the textile dyeing, printing, and finishing skills to a higher scientific level, and has worked unselfishly for this objective throughout his 41 years' connection with the industry."

While on my vacation this summer, I endeavored to combine my secretarial duties with pleasure, with some minor success in the line of duty. On August 12, I started out with Mrs. Cleverdon by auto to the western section of this country. I made up my mind that I would drive in easy stages, stopping where I would be in-

terested, and without any detailed itinerary. Also, I promised that if driving became too great a strain at my age I would leave the car and travel by other means. Surprising myself I drove 10,000 miles without fatigue and arrived home fully rested. I had a wonderful time visiting the national parks, places of scenic grandeur, and the far western cities. In Seattle we had the pleasure of having dinner with Maurice Anderson and his wife, and a tour of the city in his car. I had a pleasant telephone conversation with George Goodspeed who is a professor at the University of Washington. I tried to get in touch with Leander Dow by telephone but I imagine he was away on a vacation.

In San Francisco I had luncheon with Gordon Hawes. I tried to talk with Van Court Warren, whom Gordon says is not too well, but was unable to make connection. In Los Angeles I had luncheon with Bob Breyer. Bob is a staunch supporter of California and if I had followed out his recommendations I would still be sight-seeing in this state. However, I did follow out his "musts," to the great satisfaction of Mrs. Cleverdon and myself. I talked with Scott Gerity who is a practicing architect. I phoned Hiram Beebe but was unable to connect. — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston, Mass.

## • 1911 •

It's always nice to start a set of class notes on a cheerful note, and so this "junior Elevener" clipping from the New York *Herald-Tribune* of Sunday, October 7, under a Summit, N.J., date line, allows us to do just that: "Mr. and Mrs. Robert E. Morse [VI], of 120 Oak Ridge Avenue, at a supper party last evening, announced the engagement of their daughter, Miss Peggy Morse, to Mr. J. Putnam Brodsky, son of Mr. and Mrs. John Brodsky, of 163 Mountain Avenue. . . ." Both Peggy and Putnam were at our reunion last June as guests of her parents and we all wish them happiness and good fortune. In a note containing the clipping, Bob said: "Margaret and I both got a great kick out of reading *The Elevener* with Jim Duffy's wonderful 'log' of the 'Fabulous Fortieth.' Jim deserves a big hand from all of us for this masterpiece." You said it, Bob!

Just a bit earlier in October, President Don had sent me a New York *Times* clipping announcing that General George Kenney, I, had accepted the chairmanship for the 1951-1952 appeal of the Arthritis and Rheumatism Foundation. An accompanying photo showed George with the Foundation's president, Robert P. Patterson and board chairman, Floyd B. Odlum. An immediate letter to George brought a prompt reply, prefaced by his regret at having missed the reunion, because at that time he was "really snowed under with work due to my approaching retirement."

"After looking over the field," he continues, "I have decided to take on a respectable calling — on October 30, 1951, I am to become president of the Arthritis and Rheumatism Foundation. It is really still along the line of national defense, as

there are about seven and one-half million sufferers in this country and another 400,000 coming up each year. If we can get the money for education of doctors, establishing clinics, and continuing research, a large part of these people can be useful citizens instead of burdens to themselves and the community. Hundreds of thousands more men can be put into the armed services, at least a hundred million more can be put back into industry, and, furthermore, the taxpayer will be relieved of the burden of looking after thousands of arthritics now crowding our veterans hospitals. In our struggle with Communism, we need all the manpower we can get our hands on but we can't afford to have sick manpower — they can make tanks and airplanes, or man them, if we get into trouble. I think it is one of the biggest fields I have ever entered. It needs money and that's what I've got to convince people of, also that the returns are so important to national defense that it might mean the difference between our survival and becoming a satellite of Moscow."

A tip of the hat to Al Wilson, I, who became president of the Cambridge Chamber of Commerce on October 1. Announcement of his election was as follows: "Mr. Wilson, the newly elected president, is president and treasurer of A. O. Wilson Structural Co. He was born in Cambridge and was graduated from M.I.T. in 1911. Since his graduation he has been in the structural steel and iron business and from 1923 on he has been head of his present company. Last year he served as vice-president of the Chamber. For approximately eight years he served as Consul, representing the Swedish Government in New England. He is a past president of the Rotary Club of Cambridge, a trustee of the North Avenue Savings Bank, a trustee of Gordon College, a member of the Greater Boston advisory board of the Salvation Army and a member of the Metal Fabricators Association, of which he served as president for several years." All good wishes for a fine administration, Al!

Cal Eldred, VI, writes: "Last year I reached the retirement age with the engineering firm then known as E. B. Badger and Sons Company of Boston, where I had been employed for some years as project purchasing agent. I then became registered as an electrical-mechanical engineer in Massachusetts and Maine, to permit me to do consulting engineering work in those two states and establish an office at 247 Washington Street, Winchester, Mass., as registered professional engineer. May I call your attention to the full-page color advertisements of the Vulcan Copper and Supply Company in the January, March, May, and July numbers of *The Technology Review*. Vulcan designs and makes plants and equipment for the chemical process industries. It is my pleasure to act as engineer representative in New England for this fine company, which this year is celebrating its golden anniversary in business. T. O. Wentworth '31 is president."

Henry Dolliver, I, still with Jackson and Moreland, Boston, has been out in Lockland, Ohio, about 18 miles north of

Cincinnati, since mid-August on a "J & M" project, and writes that he may be there until February or March. "It's a rush job," he writes, "and I have to work every Saturday, so don't have time to travel very far. Have rented an apartment about six miles from the job, which I occupy as a 'temporary bachelor' — wife's at home in Belmont. Please send list of '11 men nearby. Address: in care of General Electric Realty Corporation, Post Office Box 124, Lockland 15, Ohio."

Charlie McManus, I, sent a clipping from the *Salem News* — a George Matthew Adams syndicated "Today's Talk" titled "Roadside Beginnings," in which he mentioned "the great number of notable people who had been born in the small villages of Nova Scotia." Continuing: "It was at Yarmouth that General George C. Kenney was born — he became the air arm for General of the Army Douglas MacArthur during the last World War. (I hope I can truly say the last World War!) His book *General Kenney Reports* is fine reading, and his book on General MacArthur is one that should have wide reading. I can understand why General Kenney was so deeply beloved by his 'boys.'"

Ralph Vining, III, writes from Baltimore that Ralph, Jr., received his master's degree at M.I.T. in early June and he had hoped to be able to stay over for the reunion, but just couldn't arrange it. From Ashton Plantation, Lecompte Post Office, Louisiana, Liv Ferris, VI, writes: "Vara and I are busy struggling to put this old home in shape for convenient living; and it is taking all our time and money. Perhaps by our 50th reunion I will really be able to 'retire' and enjoy that event Here's hoping!"

We had lost track of Tom Killion, III, who for years lived at the Technology Club of New York at its various Manhattan locations. Now the Register of Former Students advises that he is presently located on Bay Street in Green Harbor, Mass., near Brant Rock. Another new address supplied is that for Carl Barnes, VI, formerly at Syracuse but now at Bellona, N.Y., near Geneva and Seneca Lake.

Here is a hearty Merry Christmas and Happy New Year to you all from "Dennie and Jack," with a parting thought: Remember the Alumni Fund is again in operation and 1911 always has been one of its leading supporters among the alumni classes. Nuf' said. — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

## • 1912 •

John S. Selfridge, VI, has just been elected treasurer of the Fireman's Fund Insurance Company in San Francisco. — The Portland, Maine, *Telegram*, under the heading of "Local Boy Makes Good," tells of Charles A. Carv, I, Vice-president and Director of the Du Pont Company. Charlie started with Du Pont in 1918, managed one of their powder plants, and has worked up in rayon and nylon divisions. He also is director of the Remington Arms Company of Bridgeport.

Pierre Drewsen, X, who has been a resident of Northampton, Mass., for the last



seven years, where he was owner and manager of the Amherst Blanket Company, is seeking the Republican nomination for mayor. Never a candidate for public office before, Mr. Drewsen has, nevertheless, been a lifelong Republican and in 1940 served as general chairman of the Wilkie Clubs of Erie County, Ohio.

Arch Eicher was in the East to start his daughter, Alice, at Bradford Junior College, Bradford, Mass. Do give us a ring the next time you are in this vicinity. — Carl Rowley is operating in a large way in Cleveland. At present, Carl has under construction a one and one-half million dollar plant, two schools at one million dollars each, as well as numerous smaller industrial jobs and several private residences. Carl has an attractive home on Cape Cod to which he intends to retire as soon as he can shed himself of some of this business. Meanwhile, Carl's wife and family are enjoying their summers on the Cape.

John Shore has been connected for some time with E. D. Sherman Company, travel agents in Boston. He guarantees seats at the captain's table on cruises or transatlantic crossings that he can arrange for you. John's daughter, Elsa, is music librarian at the Boston Public Library.

Eric Kebbon, who has served as architect of the Board of Education and superintendent of school buildings for the city of New York (design and construction), has filed his application for retirement. Keb has held this position since 1938 and has been responsible for the city's large modern school building program since that time, numbering over 100 units. The James Fenimore Cooper Junior High School was awarded a Certificate of Merit for its design by the New York State Association of Architects. Keb is a member of the Architectural League of New York, the National Sculpture Society, and a charter member of the American Society of Military Engineers. Maximilian Moss, President of the Board of Education, said upon Keb's retirement: "The members of the Board of Education have known for several months of Mr. Kebbon's desire to retire to private life. During his long service, his interest and loyalty were always in the highest tradition of the educational system. He leaves behind a record of accomplishment, achieved in a most difficult situation, which attests to his integrity and ability." — **FREDERICK J. SHEPARD, JR., Secretary**, 125 Walnut Street, Watertown 72, Mass. **LESTER M. WHITE, Assistant Secretary**, 4520 Lewiston Road, Niagara Falls, N.Y.

## • 1914 •

Well, Crocker made it! *The Saturday Evening Post*, that is. The September 29 issue carried a feature entitled, "The Man with the Million Dollar Nose," and the first picture was of Ernest sniffing a "passion flower with his valuable nose." The subtitle refers to him as "the nosiest man in New England" who "once outwitted a bloodhound," or the one who "has told hundreds of manufacturers why their products stink." For all of the intimate details, see the original article where you will learn that Crocker can discern 9,000 different odors. For years, his class-

mates have known Ernest as a private encyclopedia, but this *Post* article certainly does tell the world about his talents.

In the last issue of these notes, mention was made that General Joe Wood had returned to his home city of Elizabeth City, N.C. Now, word has subsequently been received from him as follows: "I completed the course in city planning at Harvard in June, after a delightful and productive experience in associating and working with a later generation. My first observation is the remarkable progress educational methods have made since our day. Of course it is to be expected that our generation should improve on old ways. I would recommend that our classmates who have retired and now want to start a profession just to have fun or to make a contribution to the world go back to take a master's degree in some intriguing field. It's much better than just loafing. The job offers I got at graduation were amazing. Some knew my age and past experience; some didn't. One involved much more responsibility than I care to undertake and still enjoy life to the utmost. So far I am not yielding to the temptation of taking permanent full-time employment. I much prefer those jobs of three or four months on a specific municipal or regional problem which have reasonable chance of being accomplished. That is what I am doing now; work on traffic circulation and parking problems, subdivision control in suburbs and rural areas, analysis of local conditions and fiscal aspects in connection with industrial development projects, and other regional studies. I am keeping away from both zoning and housing because the former has got to be thoroughly revolutionized in concept to be effective and the latter is the main interest of everybody else who may be satisfied with the results being accomplished. It is lots of satisfaction to be able to have complete freedom within the foreseeable future. One can get lots done in three months without getting into routine and administration, and can then decide what he wants to do from then on."

A delightful little booklet has been received from Jim Holmes of Los Angeles telling of the work that Jim's firm, Holmes and Narver, Inc., have accomplished on Eniwetok. One has to see this booklet to begin to appreciate the staggering size of this project. In part, Jim has written as follows: "The booklet, format and all, was developed entirely by our own staff. This project was the type of job that will live for all time in the minds of our people who had to do with it, especially those who carried any degree of responsibility. The engineering and construction of the project was completed several months ago, but we are still out there operating and maintaining the plant until the end of this year. Our firm, of course, is busy not only with work for the Atomic Energy Commission, but also for the Army, Navy, and the Air Force."

Have you received Ross Dickson's friendly note? It is just to remind you that the Alumni Fund is back in style again. — **H. B. RICHMOND, Secretary**, 275 Massachusetts Avenue, Cambridge 39, Mass. **ROSS H. DICKSON, Assistant Secretary**, 126 Morrissett Road, Elizabeth, N.J.

## • 1915 •

Isn't that first Alumni Fund letter from Max a lulu? Looks as if he's really going to do a job for 1915 and for M.I.T. Let your checks shower down and pour into help Max hit that quota.

On October 5, at the Boston Yacht Club, Boston, these 28 classmates and their guests gathered for cocktails and dinner: Bill Brackett, Marshall Dalton, Sam Eisenberg and his guests (Thomas F. McDonough and Joseph P. Gentile '30), Reggie Foster, Fanny Freeman, Abe Hamburg, Jim Hoey '43, John Homan, Clive Lacy, Larry Landers, Azel Mack, Archie Morrison, Pete Munn, Frank Murphy, Harry Murphy, Pirate Rooney, Chet Runels and brother Ralph '11, Wally Pike and his son Pete, Jac Sindler '17, Henry Sheils, Ed Sullivan, Fred Waters, Max Woythaler. This excellent attendance made a fine showing. We were particularly happy to welcome so many guests and hope the gang will continue to bring them. Ralph Runels will have an example for his famous 1911 Class to shoot at. Jim Hoey continues to absorb lessons from us on how to organize his 1943 Class to become as famous as 1915. We were glad to have Jack Dalton back with us, as his many recent business and M.I.T. duties have made heavy demands on his time. Jack spoke about the Development Fund and 1915's outstanding contribution. Max spoke on his plans for the Alumni Fund. Clive Lacy is going to help Gene Place in the campaign for a capital gift to M.I.T. on our 50th and selected a committee and outlined his plans for the boys. Those loyal Lowell twins, Chet Runels and Reggie Foster, combined with John Homan, Fred Waters, and Max for long-distance honors.

Although they couldn't be with us, that old 1915 interest prompted Ernie Loveland to write from Marion, Mass., and Stan Osborn from Hartford, Conn. And I know you'll all rejoice with me that Speed Swift has completely recovered from his recent eye operation and will be in circulation again. He wrote to us as follows: "It just can't be done! I have already signed up for a high-brow meeting of the Newcomen Society at Norwich University in Vermont, and am taking a guest there with me. Thanks for the numerous communications during the summer. I didn't go on to Detroit at all. Give my regards to the gang. I really was hoping that this dinner was going to be my 'coming out' party after my hospital eye work this summer. My operation was entirely successful, so I am in pretty good shape to get going again."

And Hank Marion, away down there in New York, tried to join us: "When I received your announcement of the Boston dinner I had hoped that I could somehow arrange to get up there, and I did not give up hope until it was absolutely too late. I know that you had the usual fine time and I certainly would have enjoyed being there, but it just could not be worked out. However, you may rest assured that when the next one comes up, I am going to do my best to get there, if it is at all possible."

A fine Class, this 1915, and here's another proof of what I mean. Virginia

Thomas has gone to work in Washington and we wrote to Alice and Lloyd Chellman about her. Just read this sequence. First, Alice's letter (and we'd rather have her write that way than Lloyd's threatened three words): "As social secretary for the Chellman family, I'll answer your nice note we found waiting for us when we returned from our vacation at Ocean City, Md., September 19. Please forward to us Virginia's address. We would be delighted to help make her feel more at home in this city. She may have tried to contact us while we were away but there was no message to that effect. We met her at the 25th reunion I'm sure. Although I probably only met Barbara a couple of times, I have a strong liking for her due to the fact that at one of the class dances years ago Howard was so very nice to me. We even made a date for one fox trot at the 10th reunion. You can imagine how a person with an inferiority complex would remember and appreciate being made to feel at home like Howard made me feel. It's a shame such a fine person should have had to die so young. How proud he would be of his lovely wife and daughter. Rest assured, we'll be glad to do anything we can to help Virginia, not only for her own sweet self, but for her Dad, for good old 1915, 'help Azel,' and because we love people and get lonesome ourselves sometimes for good old Boston and our friends there. We were disappointed we couldn't make reunion, but with Dot's wedding on May 19, Lloyd couldn't take any more time off. He's been working hard as he always has since coming here. He's always on an emergency government project that has to be completed at a given time and he works hard to complete it ahead of schedule. He's a grand guy and I guard his health very carefully. . . . Drop a card with Virginia's address and we'll call her and do all we can to show her the old Boston hospitality. P.S. Lloyd could have said the same thing in three words probably."

From Virginia: "I've just come from a superb dinner and lovely evening with the Chellmans, and I can't thank them enough for it and you for writing them. . . . They have a wonderful record library and played some delightful pieces for me. They walked home with me and came in to see my room. I have now moved to where I am a neighbor of theirs and hope to see them often." Then, after Barbara had been down there to visit, she wrote: "The Chellmans have given Virginia a second home in Washington, and what wonderful people they are! The Class of 1915 just grows sweeter and mellower with age, if you'll pardon the use of such a word. Thanks again, Azel, for your thoughtfulness in writing to the Chellmans about Virginia's move to Washington. I think the motto should be, 'Help Barbara'; and what do *you* need help for?"

Fifteen was well represented at the June 11th Alumni Banquet at the Copley Plaza in Boston by: Lawrence H. Bailey, H. W. Brown, Evers Burtner, Marshall B. Dalton, O. Ricker Freeman, Parry Keller, Bernard Landers, William R. McEwen, P. J. Munn, Waldo F. Pike, Francis P. Scully, Henry C. Sheils. Before the dinner

many of us accepted the kind invitation of 1916 to their cocktail party in the hotel. Apparently they had a most successful reunion and party. On the Saturday evening preceding, we had cocktails and dinner at the Hotel Vendome, Boston, for the ladies of our Class. The first such evening we've had, it was a huge success bringing out many wives, daughters, and lady guests among the 60 or so who attended. With such acclaim, we plan to try it again. Wally Pike, and Barbara and Virginia Thomas headed the committee and did an excellent job. Another son of 1915 enters M.I.T. From an Ansonia, Conn., paper: "Alan Dana, Jr. to enter M.I.T. — Alan Dana, Jr., son of Mr. and Mrs. Alan Dana of 185 Wakelee Avenue, an honor student of Ansonia High School, Class of 1951, will attend . . . Technology, Cambridge, Mass., in September. Editor-in-chief of the 'Observer' Dana is a member of the Year Book staff and the Student Council. He participated in the 'Junior Town Meeting of the Air' debate and, in his junior year, was a delegate to Boys' State at the University of Connecticut. Three times, he has been a winner in the annual essay contest sponsored by the Comcowich-Carver Post, V.F.W. He was awarded a scholarship by Yale University but will enter M.I.T., where he will major in biological science."

One of a series of books by General Electric Associates for the Advancement of Engineering Knowledge, Phil Alger's new book, *The Nature of Polyphase Machines* offers a thorough understanding of the behavior of the simplest and most widely used forms of electric motors and generators.—Allen Abrams' daughter Joan remained to work in Boston, after graduating from Wellesley, and has recently become engaged to H. Langdon Smith, a Naval Lieutenant. Congratulations!

Reliable Parry Keller redeemed himself last summer with this good letter: "I have let you down badly during the past months by not writing. I received your fine letters, the pictures, and the lovely molded plastic ice bucket and appreciated everything very much. I have been busier than usual since the first of the year and have had to do quite a lot of traveling. Time seems to go by very fast and I do not have enough of it to do all that I should and want to do. I enjoy the 1915 comprehensive class notes each month in *The Review*. I hope that I can 'help Azel' better and more frequently in the future. As in past years, I anticipate the pleasure of meeting some '15 men on Alumni Day in Cambridge and in the evening in Boston. I hope that our genial Class Secretary is among them."

Supplementing the obituary notice of Albert Cornelius, Stan Osborn sends this information: "Just got around to reading the April, 1951, *Review* and came across the last item on page 5 in your 'help Azel' column. I thought I ought to drop you a line that Dr. Albert F. Cornelius attended a school for health officers at M.I.T. and Harvard which was being run in 1914-1915, with others like our classmate Jim Tobey, Dr. Harold H. Mitchell '16, Dr. Ralph W. Mendelson of Albuquerque (who incidentally was surgeon-general of the Public Health Serv-

ice in Siam, now Thailand, in the early 'twenties) and myself. He went with the American Red Cross expedition to the Balkans in the typhus fever work, which expedition consisted of 20-odd people, 10 or 12 of whom were General Gorgas' old Panama Canal group, and most of the others were from M.I.T. The engineer in charge of the unit was Ed Stuart '10; Charlie Fox and Magoon (I can't recall his first name) were two of the other engineers. Doctor Cornelius worked on typhus fever and malaria until about October when he had to leave Serbia with the others just two jumps ahead of the armies of the Central Powers, including the Bulgarians and Austrians, out to Italy through Albania, returning to this country at the end of the year. I believe he returned to Kentucky and has been practicing medicine there ever since. If you are interested in getting more about him, there is a bound diary in the M.I.T. library on the American Red Cross work in Serbia which I had typed and bound for the library. Some of the others who knew Magoon were Selskar-Gunn (now deceased), Clair Turner '26, and Dean Samuel Prescott '94."

In *Nation's Business* for July, 1951, the story, "How a Small Business Saved Itself," carries a half-page picture of Pete Munn (and a good looking one) selling securities as a community affair and describes how Pete and his company, Jackson and Company, sold a stock issue to suburbanites around Boston to refinance a local company.

Many of you who knew the fame and talents of Charlie Norton's wonderful sheepdog Meg, down on his farm at Martha's Vineyard, will be sorry to hear of her loss. From the *Martha's Vineyard Gazette*: "Meg, who for 12 long years regarded her master, Charles G. Norton, as closely akin to God if not that supreme individual himself, was unable to make a winning fight against the serious ailment which laid her low and necessitated an operation at the Angell Memorial Hospital in Boston last month. And so she gave up the struggle last week, happy at least in the knowledge that she was at home in her beloved hill country, at the Mayhew G. Norton Place in North Tisbury. Described as a model patient by the hospital staff, Meg seemed to be improving and showed deep pleasure at her return, but she failed steadily thereafter. She was widely known among year-round and summer residents, many of whom had seen the border collie in exhibition of her uncanny skill at herding sheep at a mere suspicion of a suggestion from her master. Mr. Norton had trained her carefully and patiently, and it was her greatest delight to win his extra favor with a specially skilled performance."

The New York *Times* obituary for Arthur Ball pays glowing tribute to him for some of the outstanding developments he contributed to motion pictures: "An alumnus of . . . Technology, Mr. Ball was formerly associated as an executive with Technicolor, Inc. and its subsidiary, the Technicolor Motion Picture Corporation, which manufactures motion pictures in the natural colors of the objects photographed. A number of patents in his name



concerned with color photography and equipment were assigned to Technicolor. Among the inventions with which he was credited when he was a Technicolor executive was a special camera which cost \$15,000 and took five months to build. He was technical director of Technicolor when it made 'Becky Sharp,' a pioneer color motion picture. Mr. Ball received an 'Oscar' from the Academy of Motion Picture Arts and Sciences for his outstanding contribution to the use of color in motion-picture photography in 1938. In later years, he had done work as a color consultant for the Springdale Laboratories of Time, Inc., at Stamford, Conn., Walt Disney Productions and E. I. du Pont de Nemours & Co." We shall surely miss such a splendid fellow.

With so many appeals for "help Barbara," "Max," maybe others, do I still have a chance to ask you to "help Azel" on these class notes.—AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

## • 1916 •

In the November column, we said that we would list the names of those who attended the 35th reunion in this issue. Here's the list: Walter Aiken, Joe Barker, Bill Barrett, Steve Berke, Tom Berrigan, Walt Binger, Steve Brophy, Ray Brown, Jack Burbank, Art Caldwell, Jack Camp, Jap Carr, Frank Chandler, Dina Coleman, Dan Comiskey, Bob Crosby, George Crowell, Theron Curtis, Harold Dodge, Bill Drummey, Paul Duff, Karl Engstrom, Jim Evans, Bill Farthing, Ralph Fletcher, Hovey Freeman, Jack Freeman, Gilbert Gaus, Al Giles, Barney Gordon, Hal Gray, Cy Guething, Frank Hastie, Paul Hatch, Jack Hickey, Dick Hunneman, Emory Kemp, Charlie Lawrence, Bill Leach, Chuck Loomis, Ping Yok Loo, Al Lovenberg, Charlie McCarthy, Joe Meigs, Herb Mendelson, Joe Minevitch, Hal Neilson, Arvin Page, Dave Patten, George Petit, Lewis Pratt, Izzy Richmond, Doug Robertson, Dick Rowlett, Hal Russell, Erick Schabacker, August Schaefer, Francis Stern, Leonard Stone, Ray Stowell, Earl Townsend, Hy Ullian, Norman Vile, Nat Warshaw, Duke Wellington, Steve Whitney, Bob Wilson, and John Woods.

Here are a few letters from some of the fellows who had hoped that they could be at the reunion but who at the last minute found that it was impossible: Al Lieber wrote: "It was a big disappointment to have to miss the class reunion but a pleasure to have your letter saying that a good number did attend and had a happy time. The situation which prevented my coming after I had all plans made was the fact that the commanding general of the Engineer Center, my boss, did not make the anticipated progress on an eye operation and did not return to duty just at the time of our busiest season. So here I sat. I doubt that I did the Engineer Center any material good, but at least nothing flew to pieces. I like the idea of having an annual meeting from here on out to the time that one of us will sit at the president's table and dodder along at the head of the alumni procession. And in my case, too, there is not much question but what my conduct will be quiet and orderly."

Then, there was this letter from Vert Young: "I spent practically the entire Saturday and Sunday of the reunion in my office, but kept thinking about the crowd and wishing I were present. In St. Louis last week [latter part of June] I ran into Chuck Loomis so got a brief account of the reunion from him. During the spring I had a visit from Art Shuey and his wife who live in Shreveport, La. Art has settled down in the insurance business, has several grown sons, and looks hale and hearty. He and his wife were in Europe last fall. The best I have been able to manage is four hunting and fishing trips to Canada over a period of 13 years."

Cy Guething delivered this letter from Ted Hine to your Secretary at the reunion: "I am sorry that I cannot be with you for the 35th reunion. In spite of all my planning it did not work out. I have been handling new building construction for Chrysler Corporation for about 18 years. Right now we have an enormous program under way and I have very little time for anything but work. My best regards to everyone, especially my old friends George Petit, Steve Brophy, Ralph Fletcher, Chuck Loomis, and others." John Gore expressed his regrets in this letter: "I have been looking forward to this 35th reunion ever since attending the 30th. Something has recently come up, however, that requires my attendance here June 9th. I would like to let everything drop and go but feel it is my duty to stay here. I will have to be content to wish you all 'Good Luck' and here's hoping I am still alive, and the rest of you are too, so I can see you all five years hence."

This one is from Kem Dean: "I had hoped all along that I would be able to attend our 35th reunion, but it was necessary for me to go to Boston last Thursday [May 24] and I left there Monday for Houston, so it may be impossible for me to get off again soon enough to be there on the 8th. In case I don't show up, please give my very best regards to all our classmates who do attend." Ed Williams wrote: "Due to illness in the family I am afraid it is going to be impossible for me to attend our 35th reunion at Coonamesett. However, my summer place is at North Falmouth, only a couple of miles from Coonamesett, so I am hoping to be able to come over for part of the time." We sincerely hope, Ed, that the illness has been driven from your family and that all are well again.

Morris Sanders' sister sent us this letter in answer to our notice about the reunion: "I should have written to you long ago to report on my brother, Dr. Morris B. Sanders. He is health attaché with the American Legation in Beirut, Lebanon. He has lived in Paris for many years and was appointed health attaché for France, Belgium, and Holland, with headquarters in Paris, three years ago. After about five months, he was transferred to Beirut (greatly to his disappointment, for he loves Paris) and has been there ever since. I'm sure he would want to send his greetings to the Class, but I have not forwarded all the material."

From Giichi Shimizu in Tokyo, Japan, we received this note: "Ten years ago, I

retired from the Hokkaido University and live in Tokyo now. I am sorry to tell that on account of age and distance there will be no chance for me to attend the reunion of the Class." It certainly was good to hear from you Giichi, even though you couldn't make the reunion. Don Webster wrote: "I am at present bogged down by a press of work and I simply can't find it possible to get away as much as I regret it. I enjoyed the 30th thoroughly, and will regret not being at the 35th more than I can tell you. At least I will be with you all in spirit." This letter, from Irving McDaniel: "A lot has happened to me, so I had better start at the beginning. I got tired of being retired and just watching the avocados bloom and set. After the Korean mess I decided to get back into the engineering game and fortunately I was able to locate with Holmes and Nower. Holmes and Nower are the leading engineers out here. Jim Holmes was M.I.T. '14; you have probably seen their professional card in The Review. I was to be their project engineer for Navy work in the Pacific when this job became hot, so I am project engineer up here (Indian Springs, Las Vegas, Nev.). You probably first heard of this place last February, as we got quite a little publicity for about a week. Kay could see the flashes on our ranch in southern California, about 250 air miles away. Can't write any details because Atomic Energy Commission security is most stringent. We are about 42 miles northwest of Las Vegas, real desert country. It takes me only 50 minutes to fly from Las Vegas to Ontario, Calif., which is only six miles from our ranch, so I get home often. Las Vegas is quite a place; anything goes. This week the lid is really off; it is Hellodoro Week. The old wild west was never comparable in any way. I had planned on going to our reunion; thought I could fly and spend at least a couple of days with the gang, but the job is too hot to leave. Gambling is legal here (so are lots of other things), but I stick to gambling, and 16 is still paying off."

We mentioned in the last issue that we received a telegram from Willard Brown at the reunion. Willard was on his way to Europe at the time. He has since returned and sent us this letter: "When the Class was meeting in reunion I was on the liner *Nieuw Amsterdam* en route to Europe, and of course sent a radiogram which was evidently received in time. I was on the way to the tri-annual meeting of the International Commission on Illumination which met this year at Stockholm. It happens that I am vice-president of the United States' national committee of this organization and also director of its Secretariat on Lighting Practice. This meant that I had the job of rounding up reports on lighting practice in the various fields from all the countries, and preparing a complete report, together with 150 colored lantern slides showing the various interesting, newer lighting jobs everywhere. We had three half-day sessions on this subject at Stockholm. We spent a pleasant, but very hectic (too much entertainment and attention by our English friends), week in London and flew to Oslo just in time to celebrate what seems to amount to their Fourth of July; that is, their Midsummer's night holiday which is,

of course, the longest day in the year. We were out at a country place on one of the firds. Everybody has huge bonfires on the shore, shoots off skyrocketes and Roman candles, stays up all night, and a generally hilarious time is had by all. Of course, it never really gets dark, and by 1:30 A.M. the sun is up and the birds are singing, and everybody goes in swimming in the delightful Norwegian manner. Spent a very lively two weeks at the I.C.I. meetings at Stockholm and flew to Paris; took a few days' vacation in Switzerland and Interlaken where we got to just about all the very high and beautiful places. Then a day at Brest, France, where I had spent over two years during the 'great' war. That city was completely destroyed, during World War II, and the way in which the French are rebuilding it with hundreds of buildings going up all at once is really spectacular. It seems likely to be the most modern city in France when it is done. Then home on the *Queen Elizabeth*. . . . This fall, my son, Willard C. Brown, Jr., who is in the Army, married Mona Ann Talles of Cleveland and spent a brief honeymoon at Hot Springs, in Virginia, and is now on his way to Korea. I have joined the grandfathers of the Class, thanks to my daughter who is married to Jim Pearce of Dow Chemical in Philadelphia."

During the war, in the Ordnance Department, we had a number of rather close contacts with Colonel Charlie Reed in the Pentagon Building. Charlie retired not so long ago but is back on active duty as a colonel in the Ordnance Department, and writes as follows: "I was really disappointed not to get to the reunion this year but as I had just gotten back into active duty in the Army, I could hardly ask for a leave for any purpose. With one of my sons in the front lines in Korea, frostbitten, wounded, and silver-starred, I didn't see how I could remain on the sidelines. So now I'm back in the Ordnance Department and have charge of the safety branch. We are making a phenomenal record. It's getting so the safest place to be in this country is inside the gates of an ordnance ammunition plant. If you want to know how it's done, get a copy of the *Ordnance Safety Manual*."

Maurice Holland indicated that he is very much in favor of the idea of having reunions annually from now on, in this recent letter from him: "I am delighted to learn from your letter that the prospects of having a reunion every year are very much at the front of the minds of our classmates, and I wish to enthusiastically urge the officers of our Class to do just that, in order that we may keep together the close ties on an annual basis rather than wait for five years. From now on they are more precious than gold." We agree with you wholeheartedly, Maurice, and plan to go through with the idea of a reunion each year in the future. We would like to hear from others on this proposal.

Jack Camp sent us this letter about his return-trip to Mexico after the reunion: "I left Boston on the morning of June 12 and that afternoon I picked up my new car in Detroit. The next morning I started out to Chicago, and after getting lost trying to get through Chicago, I finally reached

Glenview about 8 o'clock that night. Then two days of hard work and a day of visiting before going on to St. Louis Sunday morning. Work in St. Louis on Monday morning and then to Vinita, Okla., that afternoon; to Arkadelphia, Ark., the next day; to Fort Hood, Texas, the following day; and then to San Antonio for a much needed rest before returning to Mexico. I found the *BT* was ready so I got a friend to drive the car to Mexico while I flew the plane down, arriving here about 6:30 P.M. on the afternoon of June 29th. As usual I found a lot of work stacked up and before I could get it cleared up, the flu hit me and I was pretty low for some time, but now I am back on my feet again."

We would like to get the reaction of the members of the Class to the suggestion made by Arvin Page in the following letter: "After every reunion, I wish that we had them more often, but I know that this would not be practical. I do think that it would be worth-while to consider adding another day, starting the reunion on Thursday instead of Friday and running through Sunday as we have done in the past. Personally, this would appeal to me very much and I am sure that quite a large number of the other members would welcome the opportunity of the extra day's association with the gang."

At the reunion, Izzy Richmond told us of his plans for a trip to Europe during this past summer. We were very happy to receive a card from Izzy telling us that he and his wife, Anne, were having a wonderful time enjoying the scenic beauty of Interlaken.

The news of the reunion activities has carried the load on these first two columns of the new season. From here in, it will be up to you and your letters to keep the column rolling. Don't let us down; we're counting on you.—RALPH A. FLETCHER, *Secretary*, Post Office Box 71, West Chelmsford, Mass. HAROLD F. DODGE, *Assistant Secretary*, Bell Telephone Laboratories, Inc., 436 West Street, New York, N.Y.

## • 1917 •

It is one of those strange things that the Class Secretary always has a lot of interesting items for these notes but when the Assistant Secretary has to do the job, the news items fall off to a mere dribble. The question which logically follows is, "Why have an Assistant Secretary?" Out-of-town visitors recently included Dad Wenzell and Phil Hulbard, and Tom Meloy who still looks young and chipper due partially, we expect, to the fact that he has just sold his company, known as Melpar, Inc., to the Westinghouse Air Brake Company at a very attractive figure. His outfit will become an operating division of Westinghouse and Tom will head up this division. All of which proves that Tom, in addition to being a top-flight consulting engineer, is a good salesman. We sincerely wish him continued success.

The new School of Industrial Management does not open its doors to students until next September, but Dean Brooks, who has been on the Institute payroll since September 1st, is busy with his organization plans. We gather that Penn

thought that it was only in industry, as exemplified by Sears Roebuck Company, that people really worked but that lately he has acquired great respect for the amount of time and energy which the top brass of an educational institution expends in the course of a normal day of business. He is still looking forward hopefully to the "academic leisure" which he has heard so much about but has not been able to enjoy.

Irving Fineman, who has established a reputation as novelist, playwright, and literary critic, has resigned from Bennington College to join the faculty of the Brandeis School of Creative Arts which is headed by the well-known young American composer and conductor, Leonard Bernstein. —It has been deemed appropriate that we should revive and renew our solicitation for the 50th reunion class gift at the time of the coming reunion. Many of you have contributed to this project and to the Development Fund, too. Many others contributed to the Development Fund only and perhaps have the erroneous thought that this settles the financial problems of the Institute. Nothing could be further from the truth. Those who think this, should have a chat with our good friend Ralph Jope'28, who heads up the Development Office and who states that the Institute must develop and is now engaged in developing a long-range program which, it hopes, will insure annual substantial additions to the endowment fund. All of this planning ties in with our class gift. The Institute is going to need money in 1967 just as badly as it does today and it is the feeling of your class officers and your Gift Committee that our gift should be a substantial one. Your commitment to small annual payments over the next few years will enable us to reach this goal.

One member of our Class, who has perhaps been in on more military secrets than any others, is the good Colonel C. H. M. Roberts, until recently of the office, Chief of Ordnance, in the Pentagon, but now attached to Frankford Arsenal. During and since the World War II, Colonel Roberts has been intimately associated with many vital research and development projects for the Army. Colonel Roberts was a key member of a team which made what was perhaps the first battlefield studies of the effects of pre-landing bombardment to correlate choice of munitions with results achieved. This study was made on Kwajalein Island, southwest Pacific. He has since been responsible for pushing through a number of progressive developments to benefit Ordnance matériel. It was therefore no secret to learn from Associated Press dispatches on September 18 that Colonel Roberts and Louis Ridenour had been instrumental in teaching the Air Forces, as well as Ordnance personnel, in Korea the use of proximity-fused artillery shells and bombs. Proximity-fused shells were munition that played the decisive part in the Battle of the Bulge and in fighting off kamikaze attacks. They are now being used both against aircraft and for anti-personnel purposes, and our classmate Colonel C. H. M. Roberts is credited with a major part in this re-education program



and renewed application of this potent weapon. It is characteristic of Colonel Roberts that he has pushed projects, which seemed to him vital, with energy and skill and at the same time with complete disregard for popularity of the project or the political or diplomatic effects on his own career. — RAYMOND STEVENS, *Secretary*, Arthur D. Little, Inc., 30 Memorial Drive, Cambridge 42, Mass. FREDERICK BERNARD, *Assistant Secretary*, 24 Federal Street, Boston 10, Mass.

## • 1919 •

Recently had a card from Mrs. Mary E. Bermingham, wife of our late classmate, Franklin A., that their son is now a first lieutenant in the U.S. Army and is on his way — for the second time — to Korea. He is a senior at Clarkson College of Technology, Potsdam, N.Y. We have word from our classmate Arthur H. Blake that his son, John W., entered M.I.T. as a freshman in September after winning a small scholarship in competitive exams last June. He finalized his note with: "Here's hoping the 'Old Man' will be able to keep him going during the next four years as well as his parents did in 1915-1919." — Congratulations to our alpine climber, B. S. Coleman. He and his family climbed Mt. Whitney early last August with many a thrill.

We quote an excerpt from the August 30th issue of *Townsmen* (Wellesley, Mass.) pertaining to our classmate, Dr. Reginald S. Hunt: "Purely apart from the tremendous blessings wrought by modern anesthesia in bringing about relief from pain, but perhaps of even greater medical significance have been those developments in anesthesia which give greater scope and security to the surgeon, according to Dr. Reginald S. Hunt, Chief of the Anesthesia Department at the Newton-Wellesley Hospital. It is further stated that developments in surgery have followed developments in anesthesia which have permitted more prolonged and more radical surgical techniques than would have been possible even a few years ago." After receiving his B.S. and Ph.D. degrees from M.I.T., he completed his medical studies at Boston University and took his internship and his residency at Massachusetts Memorial Hospital. This was followed by postgraduate work at Bellevue Hospital in New York. After six years of private practice, he went to the Newton-Wellesley Hospital in 1943 where he was made chief of the Anesthesia Department. He is a fellow of the American College of Anesthesiology and a diplomat of the American Board of Anesthesiology.

Our classmate, Edward G. Moody, writes that he is engaged 100 per cent of his time in the firm of Edward G. Moody and Son, Inc., located at Nashua, N.H. He has been kept so busy that he hasn't had a chance to play golf; not even open his locker at the Nashua Country Club. He has just wound up a two-year tour of duty as secretary of the Society of Automotive Engineers, New England Section. As of October 7th, he has been named superintendent of Sunday school for the Hollis Congregational Church, for a period of one year. He has become a grandfather twice in the last seven months — a

son to his son and a daughter to his daughter. Two years ago, he built a small house in Hollis, N.H., and has since become a "Gentleman Farmer."

We learn through the September 18th issue of the *Tribune* (Lawrence, Mass.) that Dean K. Webster, Jr., of Andover, has been appointed chairman of the special gifts division (the most important division of the campaign) in the 1952 Lawrence Community Chest Drive. He has been active in the Community Chest since 1930 and was general chairman of the drive in 1939. He is treasurer of the H. K. Webster Company in Lawrence and treasurer of the New England Products Corporation of Boston. He is also a director of the Bay State Merchants National Bank and the Massachusetts Society for the Prevention of Cruelty to Children. — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 385 Madison Avenue, New York 17, N.Y.

## • 1920 •

I am sure every member of the Class joins me in expressing the deepest sympathy to Dorothea Brownell Rathbone for the loss of her son, Lieutenant Henry Brownell Rathbone, who was killed in action in Korean waters while serving on a carrier in the Far East combat zone early in August. A fine upstanding lad of 25, resembling both his mother and his late father, our own beloved Cliff Rathbone, he was an Annapolis graduate and was married only last December to Mary Jean Stevenson, now a Navy nurse at Alameda, Calif. Dorothea's daughter has presented her with another granddaughter but Dorothea takes us to task for not seeming to want to mention grandchildren. She says the rest of the Class cannot be getting the kind she has or enjoying them as much. I don't believe this, but she is certainly right that we have no evidence to the contrary. How about it, some of you grandfathers?

Sydney Kitson died at the Deaconess Hospital here in Boston on August 28. He had been associated with Worthington Pump and Machinery Corporation in Harrison, N.J., for 30 years and was manager of their public works division. He lived in East Orange, N.J. He was a member of the National Society of Professional Engineers and the American Waterworks Association. He leaves three sons.

Rear Admiral Robert Hayler has left Charleston, S. C., and is now at the Naval Training Center at Great Lakes, Ill. Scott Carpenter has moved to Lexington, Mass.; address, 83 Simonds Road. Murray Whitaker has moved from Key West, Fla., to Brunswick, Ga. Harold Smiddy, who is a vice-president of General Electric Company, is now living at 30 Sutton Place, New York City. He attended the International Management Conference in Brussels this summer, heading a group of about 75 United States' businessmen under the sponsorship of the National Management Council.

Norrie Abbott was thoughtful enough to stop in for a visit while attending a meeting of the Supreme Council 33rd Degree Northern Masonic Jurisdiction. He said that Harold Stacey was also at the meeting.

Come on, now, keep these notes from drying up. Let me hear from you. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

## • 1921 •

We are reminded by Class Agent Ed Farrand that our generous action on the Alumni Fund is an important factor in maintaining all phases of the Great White City on the Charles as we would like to have them — besides giving each one of us membership in the Alumni Association and the issues of *The Review*.

Reunion attenders who signed up for the class picture taken at the Sheldon House will have received from the photographer this remarkable panorama of distinguished men, reflecting the glory of *Mens et Manus* and looking not at all like the hungry wolves we were, irked by the balky camera's delaying attendance at the festive banquet. Additional copies of the picture may be obtained by writing to Mr. Ray Pratt, Pach Brothers, 1024 Chapel Street, New Haven, Conn. If you wish to list the names of those in the picture, here they are: Front row, left to right: Barriger, Rule, Clements, Hersum, Pauli, Reinhard, Norton, Shaw, Rodriguez, Steffian, Bawden, Jenney, DeStaebler, Knight, Moss, Bardes. Second row: Wood, Gilbert, Gartland, Lloyd, Kurth, Ferdinand, Miller, Timbie, St. Laurent, Clarke, Breed, Adams, Chellis, Kaufman, Wenick, Silverstein, Mandel, Windisch, Loesch, Zoller, Hawes, Wason. Third row: Povah, Kiley, Chilcott, Kennedy, Giles, Coffin, Harvey, Stose, LeFevre, Wyld, Bent, Farrand, Hanson, Bachmann, Myers, Williams, Pollock, Whipple, Sherry, Jr., Sherry, Nelles. Back row: Jakobson, Delany, Healy, Rowell, Jackson, Wald, Schein, Goldberg, Orlinger, Cook, Cummings, Waterman, Clarkson, Cole, Hayward, Schnitzler, Goodman, Ready, Mattson, McMorran, McGuire, Nock, Morrell.

Notes, letters, and telephone calls continue to come in regarding the reunion. Harold Bixby of St. Thomas, Virgin Islands, sent a note of regret from Pakistan. Joe Gartland sent material for class notes. John Mattson and Munnice Hawes enclosed pictures, as did Rufe Shaw, who has asked us to distribute them. Max Goldberg telephoned and communications have been received from Helier Rodriguez, Bob Miller, Al Lloyd, Ted McArn, Ed Farrand, Bill Sherry, Charlie Williams, Irv Jakobson and Ray St. Laurent. Ran into Abba Orlinger on his way to the American Chemical Society jubilee convention. Everyone had compliments for a well-directed and most enjoyable reunion and we take this opportunity to pass the praise along to Irv Jakobson and his committee members. George Chutter visited us in Glen Ridge and said a bad case of poison ivy had prevented his attendance at the Sheldon House. All Hexalphas should note that George's new home on Middle Haddam Road, Portland Conn., is just off Route 6-A. Edward M. Epstein, manager of quality control of the nylon division of Du Pont, advised that he has moved from Nashville, Tenn., and has a new home at 2210 Baynard Boulevard, Wilmington, Del. Paul L. Deylitz can

now be located at 7045 Forest Avenue, Hammond, Ind. An announcement in the Natick, Mass., *Herald* reported that Sidney Featherman had sold his 23-year old Quality Cleansing Company to become associated with Stone and Webster, Boston. He and Mrs. Featherman and their young son have a new home on West Central Street, Natick.

Fairfield E. Raymond has received two new honors: election to the Board of Overseers of Browne and Nichols School and to the Board of Directors of the Cambridge Y.M.C.A. Active in community affairs, he has served as chairman of the Cambridge Red Cross special gifts division, the Community Fund, and the Greater Boston Fund, and in boys' work with the "Y." In the management field, professionally, he had served as assistant to the chairman of the National Industrial Conference Board. In 1948, he started his current association as business manager of Browne and Nichols. He is also vice-president of the Purves Corporation. Graduated from Harvard, he received his S.B. degree with us in Course II and was associate professor of Industrial Research at Technology from 1928 to 1939. He is a member of the American Society of Mechanical Engineers, the American Management Association, the Cambridge Boat Club, and the Military Order of the World War. He and Mrs. Raymond live at 28 Meadow Way, Cambridge.

Daniel P. Barnard, 4th, is research coordinator, Standard Oil Company (Indiana), with offices in Chicago. Following our graduation, he was division director in the Research Laboratory of Applied Chemistry at Technology until 1925, obtaining his doctorate the following year and later the degree of chemical engineer from the University of Delaware. He became assistant director of research for Standard Oil of Indiana and then associate director, before assuming his present duties in 1948. He is president and a director of the Co-ordinating Research Council, chairman of the automotive research committee of the American Petroleum Institute, and a member of the subcommittee on aircraft fuels and lubricants of the National Advisory Committee for Aeronautics. He has written numerous articles on gasoline quality and petroleum products. Dan and Mrs. Barnard live at Dune Acres, Chesterton, Ind.

Boyd W. Bartlett, a colonel, is a professor and head of the department of electricity at the U.S. Military Academy. A graduate of Bowdoin and West Point before obtaining his degree in Course I with us, he is a member of the American Association for the Advancement of Science, the American Society for Engineering Education, the American Physical Society, and the Association of Physics Teachers. He has written articles for a number of technical journals and has been decorated with the Legion of Merit.

Members of the Class who have been active during the past year in various M.I.T. activities include Warrie Norton, who is an Alumni Term Member of the Corporation, a former president and member of the Alumni Council, and a former chairman and member of the Alumni Fund Board. Mel Jenney is an

alternate on the Alumni Council and has been chairman of its Audit and Budget Committee. Jack Rule is a member of the Committee on Nominations for departmental visiting committees. Lark Randall is a member of the Advisory Council on Undergraduate Publications. Representing various M.I.T. local clubs are Josh Crosby, Frank Kittredge, Lark Randall, Ace Rood, and Jack Rule. Elected by the Corporation to departmental visiting committees are: Gus Kinzel, Metallurgy; Bill Stratford, Chemistry; Charlie Herty, Chemical Engineering; Art Raymond, Aeronautical Engineering; Bill Sherry, Division of Industrial Cooperation. Among the Honorary Secretaries are: Harry Field, Hawaii; Ed Farrand, formerly in Illinois; Whit Spaulding, Maryland; Cac Clarke, Sumner Hayward, Ed Lockwood, Munnies Hawes, New Jersey; Irv Jakobson, George Welch, New York; Bill Sherry, Oklahoma; Glenn Stanton, Oregon; Charlie Herty, Pennsylvania; Si Freese, Texas; Gene Rudow, Washington; Charlie Manneback, Belgium; Helier Rodriguez, Cuba. Whit Spaulding is president of the M.I.T. Association of Baltimore; Ed Praetz is president of the M.I.T. Club of the Merrimack Valley; Irv Jakobson is a vice-president of the M.I.T. Club of New York; Glenn Stanton is secretary-treasurer of the M.I.T. Club of Oregon; Gene Weil is president of the M.I.T. Club of St. Louis.

Walter E. Church, senior member of the Portland, Ore., architectural firm of Church, Newberry and Roehr, and one of our most faithful correspondents for class notes, writes: "At the annual convention of the American Institute of Architects in May, Glenn Stanton, a Fellow, was elected national president. Irving Smith attended meetings of the Board of Directors as a representative of the Northwest District. Walter Church was made a fellow of the Institute of Architects for achievement in design, service to the Institute, and public service. Also at the convention were Sam Lunden, a Fellow and former national vice-president, Earl Heitschmidt'22, a Fellow, who was recently chosen professional man-of-the-year in Los Angeles, and Albert Kruse'22, who was also made a Fellow of the Institute for achievement in design. Dean John E. Burchard'23 gave one of the principal addresses at the convention. I recently saw Kenneth Moores, who was here from Seattle to visit his son and grandson in Portland. Jack Stanton is busy designing schools, churches and athletic fields with his partner, Francis Jacobberger. Irving Smith's son has returned from active service in Korea with the Marines and was recently married. Our son, McGregor Church, was graduated from Stanford in June." We greatly appreciate Walt's regular news from the Northwest. His kindness is exceeded only by his modesty, witness a long release from the American Institute of Architects which says that advancement to fellow is one of the highest honors the society can confer. It adds that Walt is a former president of the Oregon Chapter and a member of the State Board of Architect Examiners. He administered and supervised construction of the Oregon State Capitol and has designed many other notable public and semi-public

buildings. Walt is a native of Boston who grew up on the campus of the University of Oregon where his step-father, the late Prince Lucian Campbell, was president. Walt received his B.A. in architecture at Oregon and the M.Arch. degree with us at Technology. He served in several West Coast architectural offices on school, theater, office, and commercial structures and was a partner of the late Morris Whitehouse until the present firm was formed in 1944. He saw service with the A.E.F. in World War I and volunteered in the last war, serving as a lieutenant colonel, Corps of Engineers, on the supervision of Army installations and had the responsibility of all camouflage plans in the Northwest. He has a long record of public service in community affairs and is a member of the American Planning and Civic Association, Portland Committee on Foreign Relations, Portland Art Association, Portland Symphony Society, Oregon Ceramic Studio, Oregon Historical Society, Hudson's Bay Company Records Society, Portland Chamber of Commerce, American Legion, Portland Executives Association, Society of American Military Engineers, Military Order of the World War. Besides McGregor, Walt and Mrs. Church have two older sons: Dudley, who was graduated from Course X at Technology in 1947, is married, and has two sons. William is taking Course IV at Technology and will be graduated next June.

Dugald C. Jackson, Jr., has written a note of thanks to the Class for the expression of sympathy on the passing of his father, Emeritus Professor Dugald C. Jackson. Chick Kurth was our representative at the memorial services held October 21 at the First Church in Cambridge, Congregational, which services were also attended by Mr. and Mrs. D. C. Jackson, Jr., George A. Chutter, Mr. and Mrs. S. Murray Jones, and Everett R. Tucker. Dug advises that he has located the pictures taken in 1921 of the first group of Course VI-A, who were away from Cambridge when our class picture was made during Senior Week. We will endeavor to have lantern slides made of the VI-A group for inclusion with Bob Miller's photographic class history. Those who attended the reunion will be interested to know that George J. Hossfeld, Jr.'48, Irv Jakobson's nephew and the naval architect from Irv's shipyard who assisted on our sailing trips out of Pine Orchard and who navigated the *Dowsabel* on her return to New York, is engaged to Mary Josephine Van Hoesen of San Mateo, Calif., and Wellesley'50, with the wedding scheduled for this month. O. Kenneth Bates is assistant head of the Scientific Section, Office of Naval Research, Boston, and makes his home in Milton, Mass. He and Mrs. Bates have three daughters and a son. Dorothy G. Bell has been with the Providence, R.I., public library since 1926. She is now the librarian of the business and industry department.

A very Merry Christmas and the happiest of New Years from Ray, Chick, Warrie, Ed, and your Secretary. — CAROLE A. CLARKE, Secretary, International Standard Trading Corporation, 67 Broad Street, New York 4, N.Y.



The 30th reunion of the Class of '22 will be held at the Sheldon House, Pine Orchard, Conn., on June 6, 7, and 8, 1952. Alumni Day at the Institute will follow immediately on Monday, June 9, making it possible for the members of the Class to take in both events with a minimum loss of time from business affairs.

Professor and Mrs. Joseph Keenan spent the first half of 1951 in Great Britain where Professor Keenan served as a visiting lecturer in engineering at the Imperial College of Science and Technology in London. They returned to their Belmont, Mass., home in August. Alfred Abboud, for many years past with E. B. Badger and Sons Company of Boston, has recently been appointed manager of the chemical and engineering divisions of Kaighin and Hughes, Inc., an engineering firm in Toledo, Ohio. Ram Prasad reports from Bombay, India, that The Technology Review arrives regularly and that the M.I.T. Alumni Association is active. Parke Appel is assistant director of communications in the Belmont, Mass., Civil Defense Program.

Don H. McCreery is director of engineering with the firm of Holmes and Narver, Inc., in Los Angeles. Albert Kruse has been elected to fellowship in the American Institute of Architects. This award is one of the highest honors this professional society can confer. F. Marion Banks, chairman of the Industrial Development Committee of the Los Angeles Chamber of Commerce and president of the Southern California Gas Company, was one of the distinguished guests present at the recent opening of the new Lever Brothers Company plant in Los Angeles.

Crawford H. Greenewalt, President of the Du Pont Company, gave one of the two addresses at the dedication of the new \$30,000,000 addition to the Du Pont Company's new experimental station laboratories at Wilmington last May. Oscar Horovitz has been recognized again for his movie making ability. He has received one of the 10 awards made by the American Cinematographer for his re-edited 800-foot length picture entitled "Ringling Bros. & Barnum & Bailey Circus." In addition to his photographic activities, Oscar is kept busy as second vice-president of the Allerton Hospital, Brookline, Mass., and as president of the Technology Boston Stein Club.

Earl T. Heitschmidt was named "Man of the Year" by the Construction Industries Committee of the Los Angeles Chamber of Commerce, in recognition of his work in public service. Heitschmidt, appointed in 1949 a fellow of the American Institute of Architects, is a member of the A.I.A. National Joint Cooperative Committee and the Committee on Fellowship Procedure. In 1950, Governor Warren of California appointed him to serve on the California State Board of Architectural Examiners and in 1951 he was re-elected to the presidency of the 1951 Construction Industries Exposition and Home Show of Southern California, after having served in a similar capacity the two previous years.

Bill Boyer, on leave from General Motors, has been helping Mr. Wilson in

Washington to straighten out the confusion in the airplane industry. The Muncie Evening Press recently had a feature article showing Abbott Johnson turning up the first shovel of dirt at the commencement of the building of a new plant by Warner Machine Products, Inc., of Muncie, Ind. This new factory will have approximately 60,000 square feet of floor space that is being built to take care of the large increase in orders received by the company, many of which are for war production.

The following were present at Alumni Day last June: Abrahams, Alpert, Appel, Berry, Blackall, Brown, Chittick, Dandrow, Dillon, Dimmick, Eacker, Edwards, Warren Ferguson, Whitworth Ferguson, Godard, Goodnow, Grover, Horovitz, Huger, Macdonald, Manshel, Medalia, Miller, Myer, Nesmith, Robertson, Rogers, Rosengard, Sherbrooke, Shirey, Thulman, Tonon, Ulbrich, Vaupel, Westcott, and Wing.

We are sorry to report the following deaths of our classmates: Edward F. Bowditch of Cambridge died April 28. He was widely known in the real estate field. He is survived by his wife. Isaac Mark, Jr., died in Brooklyn, May 15, of a heart attack. He had been for many years with Consolidated Edison Company as an illumination engineer. At the time of his death he was a member of the consulting engineering firm of Powerite, Inc., of New York City. He is survived by his wife, a son, and two daughters. Everett W. Howe, plant engineer of the Providence plant of the United States Rubber Company, died suddenly on May 24 at his home in Edgewood, near Providence. He had been with United States Rubber since 1934. He is survived by his wife, a son, and a daughter. Harold W. Smith died at his home in Braintree, Mass., on August 4. He is survived by his wife and two daughters.

New Addresses: George D. Ramsay, 1237 Huntington Drive, Southern Pasadena, Calif.; Bennett Myers, 4305 Caruth Boulevard, Dallas, Texas; Lieutenant Colonel Harry H. Fisk, 409 North College Street, Rockville, Ind.; Captain Paul W. Hains, Gray Gables, Old Lyme, Conn.; Joseph Givner, 202 Ocean Avenue, Amityville, N.Y.; Lawrence M. Gentleman, 1408 Woodbourne Avenue, Pittsburgh, Pa.; Frank H. Wing, 53 Chiltern Road, Weston, Mass.; Clayton D. Grover, 392 Lawn Ridge Road, Orange, N.J.; Alexander T. Barclay, 157 Stockton Avenue, Bryn Mawr, Pa.; George W. Heathman, 2121 Logan Avenue, N.W., Canton, Ohio; Lawrence B. Eddy, Apt. 8-C-4, Sheridan Village, Schenectady N.Y.; Laurence W. Coddling, Ebasco Services Inc., 2 Rector St., New York City; Alfred Abboud, 3847 Rushland Avenue, Toledo, Ohio; Minot R. Edwards, 26 Hilltop Road, North Weymouth, Mass.; Winston A. Gardiner, Apartment 407, 506 North Second Street, Tacoma, Wash. — C. YARDLEY CHITTICK, Secretary, 41 Tremont Street, Boston 8, Mass. WHITWORTH FERGUSON, Assistant Secretary, 333 Ellicott Street Buffalo 3, N.Y.

• 1923 •

Julian E. Berla, of the Washington, D. C., architectural firm of Berla and Abel,

was scheduled to leave for Denmark in September. He participated in a program announced in August by the Economic Cooperation Administration, whereby the governments of Denmark and the United States plan to give added impetus to the technical efficiency of Denmark's civilian and military building-construction program. The program involves an exchange of Danish and American architectural and construction specialists. Berla's firm has planned and engineered such construction projects in Washington as the Kent Village-Garden Apartments and Shopping Center, the WTOP-TV transmitter station, College Park shopping center and office building, and other projects.

John E. Burchard, Dean of Humanities and Social Studies at M.I.T., has gone to Australia as a consultant to the National Library at Canberra, on the request of the Australian Government and under the auspices of the Division of Exchange of Persons of the U.S. Department of State. He left Cambridge on August 14 to visit Australia and New Zealand and will return to Cambridge on December 21. He will lecture on contemporary architecture and on modern art and society in the universities of Melbourne, Sydney, Perth, Hobart, Adelaide, and Brisbane. He will speak at meetings of architectural societies in the various capitals and confer on problems of general education in technological institutions. Dean and Mrs. Burchard will then go to New Zealand for several weeks to spend a brief vacation in the southern alps.

In August, President Truman approved for promotion to the rank of brigadier general, Colonel William G. Manley of Swansea, Mass. — Princeton University planned to place in operation during September the new James Forrestal Research Center. Daniel C. Sayre, who has been head of the aeronautical engineering department of Princeton, has been named director of the new center. Dr. Sayre reported that, as first conceived, the center was to concentrate on the aeronautical sciences. Government research contracts assured capacity use of its facilities.

William L. Stewart, Jr., of Los Angeles, reports that his son, William L., III, matriculated at the Harvard Business School in September. — HORATIO BOND, Secretary, National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. HOWARD F. RUSSELL, Assistant Secretary, Improved Risk Mutuals, South Broadway, White Plains, N.Y.

• 1924 •

Current issues of *The Tech* have a very familiar ring: "Frosh Prospects Good For Field Day"; "Tech Show Goes Into Rehearsal"; "Cross-Country Team Undeclared In First Two Starts." Same heads, different names. What were you doing 30 year ago?

If your name is Wink Quarles, you were getting ready to run the first big dorm dance in Walker. If you are Stan Cook, you were making a successful bid for a regular spot on the basketball team. If you are Gib Cowan, you were lining up Major Putney, Charlie Pitkin, and Frank

Gage to entertain the rest of us at the Field Day Victory Banquet. If you are like Lee or Jim Peirce, you were writing sizzling editorials in *The Tech* about the hard seats in 10-250, the poor service in Walker, and the crying need for grass in the Great Court. If you were Dent Massey, you were getting ready for your impending marriage in January. These were all pretty important things to us then — especially to Dent!

Well, so much for nostalgia. Now let's see what we're doing today. Actually, if the almost complete absence of news that has filtered through to my desk is a true indication, we're not doing much of anything at the moment. I hope that's not true, but it is in at least one case. Bud Robertson dropped in the other day. He's been digging tunnels under and around Boston for the last several years, and says there's enough more digging in prospect for the rest of his life. But at the moment he was held up for some reason or other, so was taking life easy. Last spring and summer Professor Martin J. Buerger toured England and the continent, attending meetings and conferences all over and visiting some of his crystallographic pals. And in October, Professor Charles H. Blake journeyed to Montreal, and gave a paper on the flight of birds before the American Ornithological Union.

Had lunch with Frank Shaw recently. Frank, of course, is our Class Agent in the Alumni Fund, and we spent a happy couple of hours talking on that subject, among others. We both felt that while we have done all right in the past on the average, we should not continue to be satisfied with that.

Watch in some near-future Review for a story on Alaska by George Tapley. Tap, as you know, is chief engineer of the Alaska Road Commission, and he's written a very interesting account of the country and some of the problems of road building there. As you can well imagine, permafrost foundations leave something to be desired. So do mosquitoes. But the scenery, says Tap, is terrific.

A feature story in the *Richmond News-Leader* entitled "Woman Meteorologist Likes Cake Making" is all about Frances Whedon (nee Bliven), the Signal Corps' only woman meteorologist. She's been on that job since 1942 doing rocket instrumentation work and, among other things, rain making.

Word has just come through that Raymond Johnson died on May 12. Many of you, especially the Course VI men, will remember Ray, the Wyoming cowboy who went back home to run the Ten Sleep Electric Light and Power Company. No details are available.

Last spring we suggested that some of you philatelists might do well to get in touch with Emilio del Prado and we gave you his address. It's been changed. If you want to write Del now, it's 17 Tamaraos Court, Parunague Rizal, Philippines. Chester Jones, career man in the Army and later the Air Force, has gone up from warrant officer to captain. He's out in Washington at McChord Air Base. Lieutenant Commander Frederick B. Britt, one of our Navy constructors, has been shifted up to the Portsmouth Navy Yard.

—HENRY B. KANE, *General Secretary*, Room 1-272, M.I.T., Cambridge 39, Mass.

## • 1925 •

Ralph F. Gow, XV, made the news with the formation of a new company known as the Norton Behr-Manning Overseas, Inc. This company will handle all of the export business and direct the subsidiary plant operations of the Norton Company and the Behr-Manning Corporation. Ralph, who is a director of the Norton Company, becomes a director of this new company.

Commander Julien J. Edgerly, XV, United States Naval Reserve, has recently received orders to Naples, Italy, where he will be electronics officer on the staff of the commander, Naval Forces, eastern Atlantic and Mediterranean. Prior to this new assignment he was serving as electronics officer at the U. S. Naval Shipyard in Charleston, S.C. Commander Edgerly has been on active duty with the Naval Reserve for the past 10 years and previously had many years' experience in electrical, sound, and engineering work. All of his Naval duty has been in radio and radar specialties, primarily in formulating training programs.

Congratulations are in order for Mr. and Mrs. Ed Kussmaul who announce the birth of their fourth child, Elizabeth Ann, on August 24. Ed is also in line for congratulations on the fine job he did in the preparation of the 25th reunion report, which I believe all of you have received by this time.—F. LEROY FOSTER, *Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

## • 1926 •

Our seafaring activities are over until June 1, 1952, since the sailboat is hauled out and the insurance policy has that date specified as the earliest date she can be put overboard. There is always plenty of activity to witness from shore, such as happened last week end within easy binocular distance, about a mile and a half off shore. A 64-foot Gloucester fishing boat floundered and hit a protruding rock when her rudder cable parted. The crew made shore in a dory as their craft listed dangerously. This week end we trained the glasses but saw no fishing boat; she had come off the rocks during a storm early in the week and had gone to the bottom. A rugged business this fishing. Now, having pointed out that there are a few distractions for a secretary writing class notes at Pigeon Cove, we will get on with the business.

As usual, Jim Killian is the staunchest regular contributor to the class notes. Never does a classmate visit, communicate, or contact Jim without your Secretary receiving a prompt report. Recently Jim had a couple of '26 visitors from afar: Horatio Capurro from Soriano, Montevideo, and Shantanu L. Kirloskar of Poona, India. Horatio has become a successful engineer and contractor in Montevideo and came to the Institute this fall to bring his 19-year-old son, Horace, who has just entered the freshman class.

We regret that Horatio was not able to make our 25th last June but will have to admit that his mission this fall was more important. We hope to meet son Horace soon, especially since he is reported to be a top-flight yachtsman. Classmate Kirloskar was passing through New England on an extensive trip with his wife and paid a visit to the Institute. His son, who has been studying engineering at the University of Maine, returned to India with his parents. Shantanu is the head of several manufacturing companies in India. Jim Killian has also passed along clippings and political flyers about Jim Bamford of Reading, Pa. Yes sir, we now add a budding politician to the Class of '26 roster. Jim Bamford has been nominated Republican candidate for mayor of Reading and will, we hope, by the time these notes are published, have been elected. Jim has many qualifications for the job, not the least of which is his M.I.T. engineering training. His campaign activities kept Jim Bamford from our reunion, but if he is elected we will excuse it. Our star reporter, Jim Killian, has recently purchased a farm in a not-too-distant and very beautiful part of New Hampshire, at Greenfield. This is in the Monadnock Mountain area near Peterborough and, while we have not seen Jim's new place, we have heard much about it from a friend of its former owner; it sounds as though he has found the ideal spot to become a country squire. We did our best to locate Jim on Cape Ann, but were unable to find a spot here comparable to the one he has acquired. We extend, for the Class, best wishes for relaxation at the new home.

The clipping services continue to bring us news of the architectural accomplishments of Barney Gruzen. This summer Barney's firm received an award of merit from the American Institute of Architects for the design of the Veteran's Hospital at Wilkes-Barre, Pa. Barney also won third prize in an international architectural competition for the design of a monument and park to memorialize Theodore Herzl, founder of Zionism. The memorial is to be located at the site of Herzl's grave near Jerusalem and will be an outstanding feature of the new state. Congratulations, Barney, for the new honors!

A clipping from Hartford, Conn., tells of the election of Bill Forrester to the board of directors of the Phoenix State Bank and Trust Company. Bill, as you know, is financial vice-president of Hartford Fire and Hartford Accident and Indemnity Companies, having gone to Hartford a couple of years ago from New York where he was vice-president of the National City Bank. He is also a director of the Dime Savings Bank in Hartford. Bill seems to be cutting quite a swath in Hartford financial circles for a recent arrival in the insurance city. The *New York World Telegram* and *Sun* ran a story this summer about the real estate activities of Peter Doelger, Inc., whose president is our classmate, Pete. Pete is building a series of modern apartment houses on the site of the old Peter Doelger Brewery at 55th Street and Sutton Place. The first unit, a 16-story building and penthouse, was completed in 1949; and the second



unit, a 12-story and penthouse apartment, was completed this summer. A third unit is now under way and the group of apartment houses features a tennis center as the focal point of interest. We have mentioned before that Pete comes to Rockport in the summertime, and now he has brought his building activities with him, having acquired a very old New England home which is undergoing extensive alterations. We seem to be hitting the New Yorkers in a group. Dudley Parsons, who heads up his own public relations company in New York, was recently elected vice-president of the American Institute of Graphic Arts, a national organization interested in fine printing and the only one of its kind in the country. In checking the connection, we find that Dudley is also president of Appleton, Parsons and Company, Inc., an outfit which produces a great deal of top-drawer corporate literature. We have the good news to report that Ernest Warburton has been promoted from colonel to brigadier general of the Air Force. Ernest has had a career in the Air Force since graduating from the Institute and entering the Air Force as a flying cadet, receiving his wings at Kelly Field in 1926. He served in all theaters in the last war and holds a whole flock of medals. Congratulations, general. While on the military, we will report another important assignment: This time it's the Navy. Captain Francis H. Whitaker, who came to the Institute after graduating from Annapolis and obtained a degree with the Class of '26, has recently taken command at the Fore River Shipyard in Quincy.

The clippings continue to roll in about Father Arthur J. Riley who seems to be very active these days making speeches before Knights of Columbus organizations in many different cities. We can remember, back in the undergraduate days, of meeting Dick Pough prowling around the beaches and rocks of Gloucester with a pair of bird glasses. Dick has clung successfully to what was then his avocation and, as we have previously reported, is now curator of conservation of the American Museum of Natural History. Dick's most recent achievement is a new book entitled, *Audubon Water Bird Guide*. The next clipping is about my coworker on the thesis, Arthur J. Brockelman. Recently a gigantic suburban shopping center, known as Shoppers' World, was opened in Framingham, Mass. One of the stellar features in the new center is Brockelman Brothers supermarket. The market contains 30,000 square feet, which is doggone near an acre, and includes a \$100,000 bakery. This super-duper supermarket marks the 16th in the Brockelman chain and this market alone will have a staff of 200. Arthur is, of course, president of the outfit. I hope that you saw the October issue of *Fortune* which contained a magnificent article about the Standard Oil Company of New Jersey. Actually the first thing that your Secretary did was to glean through the pictures taken of the various committees that run the company to look for our Class President, Dave Shepard. Sure enough, there was tall, dark, and handsome over in the corner of one color photo and with back facing the camera in another photo.

While reading the paper on the train the other evening, a very good likeness of Dick Plummer caught our eye as we glanced through the financial page. The story beneath the picture announced that Dick had just been appointed manager of Arthur D. Little Company in Mexico. Henry Rickard recently dropped into the office for a quick visit and to tell us that he was leaving New England to accept a position with Crown Cork and Seal Company in Baltimore, Md.

We promised to start the class biography this month and we will give the history of one of our classmates who filled out the questionnaire which was handed out at our 25th reunion. If you did not receive a questionnaire at the reunion or did not receive one because you were unable to be there, drop a note to the Class Secretary and one will be mailed to you. The number of these sketches that we publish during any one month will be in inverse proportion to the amount of class news for the month. We suggest that you paste each of these sketches in a scrapbook and as the book grows we will work out some kind of index. The men selected each month will be by the eeny-meeny, miny, mo system and, therefore, will not be alphabetical. Each sketch, however, will be given a consecutive number so that indexing will be simple. For Number 1, we have selected a classmate who has just been made vice-president of his company, and the brief sketch will outline how he arrived there.

NO. 1 — CHENEY, STANLEY — Stan came to the Institute from Phillips Andover Academy and graduated in Course V. He first went with American Woolen Company as a chemist; then, after a couple of years, joined United Fruit Company for three years, also as a chemist. In those days he used to gather with a group of local '26 bachelors for dinner every few weeks (Pink Salmon, Bob Dawes, John Fletcher, and your Secretary). None of us stayed bachelors for long, including Stan. His family now consists of his wife Dorothy, a daughter Barbara, 15, and a son Robert, 10. In 1931, Stan went with Plymouth Cordage Company as an industrial engineer and eventually became a fiber purchasing agent. Stan always remained active in Chemical Warfare Service and in 1941 went into the service as a major, ending up in 1945 as a colonel and commander of the San Francisco Chemical Warfare Procurement District. Stan returned to Plymouth in 1946 in the fiber department and in 1948 was named manager of that department. (In a rope works, it would seem that the fiber department might be fairly important.) Stan's activities take him to all corners of the globe; as, for example, South and Central America, Philippines, Africa, and so on, and he, consequently, has little time for avocations. Very shortly after reunion last June, Stan was elected vice-president of Plymouth Cordage. Your Secretary has made a special arrangement with Stan to furnish a five-foot length of rope with a pre-tied noose to any '26 man who should become despondent. He says that from his observations at our 25th reunion he expects no takers whatsoever.

See you in January and a very Merry Christmas. — GEORGE WARREN SMITH,

General Secretary, E. I. du Pont de Nemours and Company, Inc., Room 1420, 140 Federal Street, Boston, Mass.

## • 1927 •

To those of you who have not yet returned the questionnaire for the class book: It is essential that these be turned in without delay. The book can't be published unless we have virtually everyone represented.

Ralph Johnson arrived in the country this month from his home in Honolulu. He is attending the advance management program course at Harvard University. Jim Lyles gave a party for him recently. A recent article in the *New York Herald-Tribune* gives us the following information about J. Robert Bonnar: "A joint research effort by General Dyestuff Corp., General Aniline & Film Corp. and Owens-Corning Fiberglas Corp., has resulted in the development of a process for the dyeing of fibrous glass with no reduction in its flame resistance, it was announced yesterday by J. Robert Bonnar, technical director of General Dyestuff Corp. This process overcomes long standing difficulties in the dyeing of fibers and materials made from glass and will result in the broad application of fibrous glass materials in homes and public gathering places. We can now foresee the future availability of many fast-to-light and washing shades which combine beauty with good serviceability. Owens-Corning Fiberglas is producing the material for consumer evaluation by the trade."

Harland P. Sisk, former assistant superintendent of the distribution transformer division of the local General Electric Company plant, and currently general manager of the G.E. Holyoke plant, is being returned to Pittsfield, Mass., to take over the post of superintendent of the distribution transformer division in the local plant. — JOSEPH S. HARRIS, *General Secretary*, Shell Oil Company, 50 West 50th Street, New York, N.Y.

## • 1931 •

Last month's notes carried a résumé of the 20th reunion, and the good time that was enjoyed by all who were there. The report of the week end did not mention the fact that the subject of our 25th reunion received much discussion and also some financial support. Plans for this reunion are in the formative stage and any comments or suggestions will be gratefully received by your Secretary.

Several of our classmates have been in the news lately. Standish Deake, who has been teaching in Vermont, has rejoined the faculty of Milton Academy where he will teach chemistry. That will make at least three of our Class living in Milton, since Art Donovan and I are both residents. Frederic Nordsiek has been appointed assistant secretary of the American Cancer Society's research committee. Fred comes to his new post after eight years with Standard Brands where he served as research administrator. His new work will involve assisting in the supervision of cancer research grants which at the present time total more than \$3,500,000. Gilbert Roddy has been elected a trustee of Wheaton College. At present Gil is

treasurer of the Boston Manufacturers Mutual Fire Insurance Company and the Mutual Boiler and Machinery Insurance Company.—AUGUST L. HESSELSCHWERDT, JR., *Secretary-Treasurer*, Room 3-240, M.I.T., Cambridge 39, Mass.

## • 1932 •

Your committee for our 20th reunion has been busy with preliminary planning. A definite commitment has been made to hold the reunion at the Curtis Hotel in Lenox, Mass., on June 6, 7, and 8. If you have any comments or suggestions, feel free to get in touch with our chairman, Tom Sears, at 31 St. James Avenue, Boston 16.

Al Dunning of Springfield, has been appointed vice-president of Monsanto-Kasei Kogyo, K.K., of Tokyo, Japan. Al has been sales manager for coating resins and raw materials at Monsanto since December, 1945. His wife, the former Lois Thompson of Washington, and their three children will accompany him to Tokyo about the first of the year.

Bob Phemister has been appointed division comptroller of the phosphate division of Monsanto. He has been with them in St. Louis since 1942. A note has been received from Martin Meyer saying that his sons—Richard, aged eight, Jimmy, aged six, and Johnny, two and one-half—now have their little sister, Carol Jean. She arrived August 19.

This is being written before you have received the November issue in which I asked for more news. This will serve as a reminder in case you have forgotten to heed my earlier advice. The 20th reunion next June!—CLARENCE M. CHASE, JR., *Secretary*, 1424 East 7th Street, Plainfield, N.J. *Assistant Secretaries*: CARROLL L. WILSON, Cannondale, Conn.; WILLIAM A. KIRKPATRICK, Allied Paper Mills, Kalamazoo, Mich.

## • 1936 •

Hello again, and, incidentally, your Secretary is getting very low on news for The Review. Surely many of you have material which would interest the other members of our Class. It doesn't take very long to get off a short letter or post card, so regardless of how busy you are, please make every effort to let us hear from you more often.

Although the November issue listed those attending the 15th reunion, we did not give you a run-down of the classmates who were present for Alumni Day, June 11; therefore, we will do it now for those who may be interested: Fred F. Assmann; John C. Austin; Alan E. Brigham; Joseph A. Burns; Everett H. Cargen, Jr.; Gerard Chapman; Harry E. Essley, Jr.; William W. Garth, Jr.; Robert S. Gillette; Martin A. Gilman; Alwyn B. Gray; Edward S. Halfmann; Anton E. Hittl; Alice Hunter Kimball; Richard K. Koegler; Elwood H. Koontz; James H. Leary; Roger E. LeBlanc; Henry F. Lippitt; Brenton W. Lowe; Rudolph J. Ozol; George A. Parkhurst; Lawrence G. Peterson; Fred A. Prahl, Jr.; G. Elliott Robinson; Edward B. Rowe, Jr.; Leonard S. Stoloff; Ariel A. Thomas; Fletcher P. Thornton; Roman I.

Ulans; and, of course, yours truly. May I make a suggestion at this point. All of you who did not attend this year's Alumni Day, jot it on your calendar for next year as a "must."

We hear that several months ago Clarence R. Horton, Jr., was appointed manager of the Engineering Development Department of Dravo Corporation's Engineering Works Division, Pittsburgh. He has been with Dravo since he left M.I.T. in '36, in various engineering and production capacities. He is responsible for the introduction of many improvements in the design of river towboats and barge fleets during his association with Dravo. Albert K. Romberg, whose work centered around flotation and buoyancy of ships while at M.I.T., will be in charge of design and construction of the Navy's first submarine to use atomic power. He lives in Red Oak, La., and beyond his successful career, he has two daughters—Ann, 15, and Sarah, 11. Robert B. Woodcock, who is President of the John M. Glover Agency in Norwalk, Conn., has been elected to the Y.M.C.A. Board of Directors of Norwalk. He has been active in Y.M.C.A. work since his arrival in Norwalk, in 1946. He is also a director of the Kiwanis Club, and a past chairman of the Kiwanis underprivileged children's work. The White Motor Company has opened a new industrial sales division in Cleveland for the purpose of developing new markets for component units of White Trucks and Busses, and Milton W. Brooks has been named sales manager of that division. Milt Brooks has, for the past three years, been regional sales manager of the Cummins Engine Company, Inc.

James L. Vaughan has been appointed director of the Process Engineering Department at National Research Corporation, Cambridge, Mass. Prior to his new assignment, he was with Rohm and Haas Company, Philadelphia. News comes from Washington, D.C., that J. Ross McKeever is now assistant director of the Urban Land Institute. He is well suited for this position since he has had wide experience in community planning, including work with the Boston City Planning Board, the mayor's committee on modernization of building code and zoning law, Cambridge, Mass., and was liaison officer between the John Hancock Mutual Life Insurance Company and the Gustave Ring Construction Company in building Hancock Village apartment and shopping center.

Harry C. Kelly, who received his Ph.D. in Physics at M.I.T., was recently appointed assistant director for the Division of Scientific Personnel and Education, National Science Foundation, Washington, D.C. Dr. Kelly has two sons and is now living in Arlington, Va. Gerald S. McMahon is now living in Lake Charles, La., and is connected with the Cit-Con Oil Refineries.

Another one of our classmates who gave up his bachelorhood last August 25, was Frederick L. Kingsley, who married Lillian Anderson, daughter of Mr. and Mrs. Axel Anderson of Springfield, Mass.—ROBERT E. WORDEN, *Secretary-Treasurer*, Fidelity-Philadelphia Trust Building, Philadelphia 9, Pa.

## • 1938 •

Several '38 men are in the news this month. With appropriate ceremonies, Howard Ness has been transferred from his position as supervisor of the cable accounting department of the American Steel and Wire Company to the company's Cleveland office where he will be assistant chief accountant. The General Electric Company has announced the appointment of Forrest Judkins to the position of general foreman of the power transformer test section. Forrest's current address is New Lenox Road, Lenox, Mass. Francis Buffington, who is an assistant professor of mechanical engineering at California Institute of Technology, has been back to Technology to earn his doctor's degree. The Buffingtons, with their two children, Francis, Jr., 11, and Roger, eight, live in Altadena Calif. Fred Hurley has also been back to school, having earned his master's degree this spring at the Harvard School of Business Administration.

Don Robbins, has been elected assistant vice-president of the Singer Manufacturing Company. Don, who received his master's degree in '38, did his undergraduate work at Dartmouth. Don and his wife Anne Patrick, have five children: Anne, 14, Henry, 12, Bruce, 9, Lawrence 7, and Patricia, 3. It has been announced that John Iglauer has been appointed to the post of deputy city manager of Grand Rapids, Mich. He has previously been employed by the International City Managers' Association, the town of Montclair, N.J., and the War Production Board. He has also served as consultant to 20 Michigan cities in drafting modern home-rule charters. Also announced is the assignment as an instructor at Fairfield University of the Reverend William G. Guindon, who attended M.I.T. in the Class of '38 before entering the Society of Jesus in 1936. He later returned to Technology to receive a Ph.D. in theoretical (nuclear) physics. For the past few years he has been concluding his theological studies for the priesthood, to which he was ordained last year. Warden Hartman has been appointed manager of the Industrial Insulation Department of the Armstrong Cork Company. Except for a four-year period of military service, Warden has been with Armstrong since his graduation. In Heidelberg, Germany, the Army has promoted both Staunton L. Brown and Ellery W. Niles to the rank of colonel. Brown is deputy chief of the installations branch in the logistics division of Command Headquarters, while Niles is chief of the engineering section in the engineer division of Command Headquarters. Wenzel Wochos is now plant manager of Plant Number 2 of the Elgin National Watch Company. He is currently engaged in getting material and machine products for some of the defense work which comes under his jurisdiction.

From the change of address notices we note that John Cook is with the Warren Wire Company in Pownal, Vt.; Ken Gunkel is with W. R. Grace and Company in New York, having returned from Lima, Peru; Matthijs Boissevain is with the Electric Boat Company, Groton, Conn.; and Dick Muther, one of our assistant class



secretaries, can now be reached at 116 West 67th Terrace, Kansas City, Mo. — ALBERT O. WILSON, JR., *General Secretary*, 24 Bennington Road, Lexington 73, Mass. *Assistant Secretaries*: DAVID E. ACKER, 210 Woburn Street, Lexington 73, Mass.; FREDERICK J. KOLB, JR., 211 Oakridge Drive, Rochester 12, N.Y.; RICHARD MUTHER, 116 West 67th Terrace, Kansas City, Mo.

## • 1940 •

This month I received letters from two of our fast vanishing group of bachelors. In fact by the time you read this column, one of them will have left the ranks. The first letter is from Milt Green, dated September 24th: "I delayed writing for a while because I was hoping to see you at the A.C.S. meeting in New York a couple of weeks ago. Of our Class, I saw only Karl Pfister and Massimo Baer, who is working for Monsanto in Springfield, Mass., and looking very well. Last Monday I was walking through the hallowed halls of the Institute and found myself in the midst of a group of registering freshmen. It made me realize suddenly how fast time is slipping by, 15 years since we entered Tech. I've been wondering whether or not I have the dubious distinction of being the last member of our Class to get out of school or if some other sucker, even slower than I, is still at it. Anyway, it feels wonderful to be working again, to have an income, and a little time to myself. The last few months of my graduate work were a terrific strain. I've been trying for years to get back to New England, and if getting a Ph.D. was responsible for my being able to find a job in God's country, then it was well worth the effort. I'm doing chemical research in connection with the Polaroid-Land Camera, the one that takes a picture in a minute, and I'm happy with the work and the company. Salaries are somewhat lower in the Boston area, but there are other compensations. One of them is being within five minute's walking distance from Technology. The new air-conditioned library is a lifesaver on a hot humid day. Unfortunately, many of the chemical journals are still in Eastman. After work or on a week end a couple of hours of sailing are ideal for relaxation, as is a dip in the pool. Still single, and no immediate prospect of changing that state but some year I'll surprise everybody. That's the story in a nutshell."

Two days after receiving Milt's letter I had one from Bob Hess: "Scratch another name from the list of '40 bachelors. (How many are left now?)" On October 20, Nancy Jane Hirsh of Wyncote, Pa., will lock the old ball and chain on me, and I'll have to settle down after all these years of roaming. Since last fall I have been associated with General Plastics Corporation in Clifton, N.J., as production manager. We specialize in Teflon and Kel-F coatings. These two plastics are noted for their chemical inertness, high-temperature resistance, antisticking, and electrical properties. Most of our applications have been for antisticking; nothing will adhere to these plastics. That's all that's new with me at present. Am enclos-

ing my dues for five years." (\$2.50 free advt.)

Names of '40 men continue to play a prominent part in the society columns. Matilda Bernice Acciavatti was wed to John Francis Hyde this past August, while Maureen Phyllis Schwartz and J. B. Feldman were married in September. Louis Michelson, who has been chief of the depth charge division of the U.S. Naval Ordnance Laboratory since 1950, has been made technical director of the research and development department of the Naval Torpedo Station at Newport, R.I.

Joe Havens received a master of arts degree from the University of Southern California in June. The Alumni Office is interested in obtaining the current address of one of our classmates, Mrs. Stephen White (maiden name, Miriam Wheeler.) — To each and every one of you a Merry Christmas and a most enjoyable New Year. — ALVIN GUTTAG, *General Secretary*, 7114 Marion Lane, Bethesda 14, Md.

## • 1948 •

Engagements announced recently include those of Lincoln Richardson of South Lincoln, Mass., to Katherine Lansdowne of Wellesley Hills, Mass., and the University of Wisconsin; David Finnegan of Brooklyn, N.Y., to Eugenia Schwanda of Stafford Springs, New Haven, Conn., and the University of Connecticut and Yale School of Nursing; Thomas Monroe to Gwendolyn Gates of Drexel Hill, Pa., and Emerson College; Joel Rossen to Barbara Cohan of Portland, Maine, and Lasell Junior College; Robert Lewis to Nancy Gillet of South Woodstock, Vt., and the Chandler School.

Weddings which have taken place since we last reported to you include Frank Heilenday, Jr., to Joan Brandmeyer of Newark, N.J. She attended the Small School and Essex Junior College. They are living in Buffalo. William Wells, Jr., to Janet McBride of Port Chester, N.Y. Mrs. Wells is an alumna of Wellesley College. John Gilchrist of New York to Joan Miller of Washington, Conn. The bride graduated from Smith and she attended the University of Geneva. Milton Pohl of Lawrence, Long Island, to Jane Goodman of Hewlett Bay Park, Long Island. Mrs. Pohl is completing her studies at the Adelphi College. Milton Slade of South Dartmouth, Mass., to Jean Hupper of Melrose, Mass. The bride was graduated from Middlebury College. Donald Kuehl of Medford, Mass., to Carol Goodyear of Springfield, Mass. Emerson Callahan of Newtonville, Mass., to Virginia Walker of Elmhurst, Long Island. Mrs. Callahan is an alumna of Queens College. Thomas Cantwell, Jr., of Aurora, N.Y., to Janice Bowman of Stratford, Conn. She graduated from Radcliffe and plans to attend the management training course this coming year. Leonard Salter to Eleanor Tibbets of Boston. Thomas Pawel to Nancy Ray of Waban. She is a Wellesley graduate. Irwin Lebow of Newton Center, Mass., to Grace Hackel of Brookline, Mass. The bride is a senior at the Boston School of Occupational Therapy. Verity Smith to Marcia McKee of Wellesley Hills and Duxbury, Mass. Mrs. Smith was

graduated from Wheelock. Robert Auty to Beatrice Powers of Darien, Conn. Mrs. Auty graduated from Pembroke College. John Beebe-Center, Jr., to Ruth Nicholson of Salem, Mass. The bride attended Mount Holyoke. Robert Dean of Wellesley, Mass., to Edith Hayes of Wollaston, Mass., who attended Wellesley College.

Other news reported to us recently includes the fact that Stuart Thayer has been called to active duty in the Navy. Stuie was employed at the Lykes Brothers Steamship Company of New Orleans before he was called up. He is married to the former Marilyn Rossback of New Orleans. Robert L. Deming has been added to the staff of Los Alamos Laboratory. He will work in the Weapons Division. Alvin Ring has been employed by Monsanto's Merrimac Division. He will work as an instrument engineer. Previously he had been working with General Foods in Woburn, Mass. Harry Davis has been appointed instructor in integral calculus in the Lincoln School of Northeastern University.

At last reports, Alan T. Davisson was working for William H. Coburn and Company, an investment counsel in Boston at 68 Devonshire Street. Al would like to hear from some fellows who have been scattered about the country. Elmer Larabee is an instructor at M.I.T., and he has been teaching 16.10 and 16.62. He's been spending his six-week vacations with model airplanes, an English automobile, and making a record player. Leonard Muldower is an assistant professor of physics at Temple University.

Until the January issue, best wishes, and keep those letters coming. — WILLIAM R. ZIMMERMAN, *Secretary*, Kurt Salmon Associates, 3000 Albermarle Street, Washington, D.C. RICHARD H. HARRIS, *Assistant Secretary*, Lovell Road, Holden, Mass.

## • 1949 •

I have just unearthed some notes Kee Taschioglou gave me the day before I was married about fellows he ran into at Alumni Day. Robert Cowen, living in Cambridge, is a natural science writer for the *Christian Science Monitor*. Leslie Cline is a sales engineer for his Dad's firm of Cline and Thornton in Philadelphia. George Ray and Harrison Horn are electrical engineers with Spencer-Kennedy Laboratories, Cambridge. Bill Mitchell and Dave Stallard are both second lieutenants in the Army. Bill is at Camp Pickett and Dave is with the Army Signal Corps in Yonkers, N.Y. By the way, while we were tramping about the geysers in Yellowstone, we ran into another servant of Uncle Sam's in the form of Charlie Kalfadelis. Despite all the beautiful scenery, Charlie was playing bridge. Evidently all that his sojourn at Dugway Proving Grounds provided was mucho scenery — trees and rocks to you city folk.

Two of our architects made the news this month: Gordon Phillips, winner of second prize of \$30,000 in the recent St. Louis Riverfront Memorial Design Competition, has been named associate professor of architecture in the Washington University School of Architecture, St.

Louis, Mo. Prior to this, Gordon had been chief designer for Clas and Redeemann, Inc., in Milwaukee and consultant for plans for the Milwaukee Civic Center Project. He has also taught at Montana State College as an associate professor of architectural design. William Cowles has opened an architectural office in the country near Burlington, Vt.

On August 30, the University of Minnesota awarded Joseph Apelbaum the master's in science in electrical engineering. Roland Jalbert has accepted the position of radiation physicist in the Tumor Institute of Swedish Hospital, Seattle, Wash.

**Engagements:** Guilford Forbes to Helen Black of Albany, N.Y. Gil is with the new departure division, General Motors, Meriden, Conn. Warren Joy to Shirley Patterson of Amesbury, Mass. Paul Ostergaard to Jacqueline McKnight of Rockville, Conn. Paul is in the actuarial department of Phoenix Mutual Life Insurance Company, Hartford, Conn. Paul Sawyer to Sarah Nichols of Newton, Mass.

**Weddings:** Norman Andrews to Margery Mag on August 26 in Middleboro, Mass. Edward Dinowitz to Elaine Sadow on September 13 in Boston. Ed is with Raytheon. Robert Grott to Alice Doe on September 8 in Hyde Park, N.Y. Bob is with J. O. Ross Engineering Corporation, Los Angeles, and will reside in South Pasadena. Peter St. Germain and John Redpath were ushers. Frank Lane to Elizabeth Scott on August 11 in West Addison, Mass. Frank is a biology instructor at Middlebury College. Bernard Rosenberg to Faye Goldner on August 18 in Syracuse, N.Y. Bernard is production manager of the Mayburn Knitting Mills, Hoboken, N.J. Joseph Vitka to Mary Burke on August 25 in Salem, Mass. Hurrah!

Jim Stevenson, after graduation, became the production control assistant in the Chase Brass and Copper Company, Waterbury, Mass. A Marine pilot at Midway in the last war, Jim was recalled to active duty in September, 1950. In April, 1951, at Orange, Calif., James A. Stevenson, III, was born; and in June, Jim was attached to V.M.F. 312, a fighter bomber squadron, which shipped overseas. The Defense Department notified Grace, his wife, that Captain Stevenson had been killed in action in Korea on September 14. Grace and James III are now making their home at 32 Lodge Street, Milton 86, Mass. This, our first death in this war, painfully brings into focus the realities of Korea to us who were Jim's friends and classmates, and personally, I, who enjoyed Jim's companionship as a fraternity brother and roommate, find words too shallow to express my regrets. — CHARLES WILLETT HOLZWARTH, *Secretary*, 33 East Empire Street, San Jose 12, Calif.

## • 1950 •

Announcement has been received here of the marriage of Helen Groh and Richard Noel Holden on August 18. Dick is employed by the Shell Oil Company and the couple will reside in Houston, Texas. Our good friends Fred English and Sylvia Tuxbury also managed to tie the knot of matrimony on September 8 in Amesbury,

Mass. They will motor to Atlanta, Ga., where they will take up housekeeping before finally moving on to Burbank, Calif., Bud's home base for Lockheed Aircraft Corporation, his employer. Fred had three loyal M.I.T. men as ushers at his wedding. They were Chester Claff, Jacob Bartas, and old reliable J. J. Earshen. Marie Paulsen and Hollis Loughton Gray, Jr., were wed at a candlelight ceremony last summer. The Walter B. Joneses will make their home in Bryn Mawr, Pa. Mrs. Jones is the former Marie Jean Dunlevy. Helen Paris of New Bedford, Mass., was wed to Charles Levy of Flushing, Long Island. Joan Lauritzen and Joseph Miano were wed at the Christ Church Cathedral in Hartford, Conn., on September 15. Harlan Pickering really wed into a family of males. At the wedding of Harlan to F. Ellen Duff last August, Ellen's brother was best man and five other of her brothers were ushers. Harlan is employed by General Motors and the couple are making their home in Kansas City, Mo. Richard Potts took time out from his Army duties at Aberdeen Proving Grounds to attend to the duties of Dan Cupid. Dick was wed to Mary S. Prettyman on August 18 and, after a wedding trip through New England, the couple headed south for Wilmington, Del., where they will live. Robert Randall is also headed in the same direction. On August 10, Bob was wed to Dawn Vickery Weathersby, and, after a wedding trip through the Poconos, Mr. Randall will leave his civies behind, put on a uniform, and report for active duty at Aberdeen. Beverly Mae Partridge and Charles Henry Sherman were wed at a candlelight ceremony on September 1, and they will reside in Cambridge, Mass. Martha Mae Lewis became the bride of Roger Stuart Whitley on September 22, and, after a trip through New England, they will reside in Boston. And last, but by no means the least. Joe (the man with the laughing face) Gottlieb and Vera Leonore Cohen were wed in New York on July 14.

I also have word of seven engagements: Patricia Keshen to Lieutenant Joseph Freeman, U.S.A.R., who will be stationed at Fort Devens shortly; Mary S. Rapley to James A. McMartin, working in Baltimore, Md., as a construction engineer; Archdale Hope Hunter to Earl Edgar Patterson; Alice Chehalo to Samuel E. Perkins, 2d, now working for Arthur D. Little Company; Wilhelmina Mixer Eaton to John Allen Reid; Ruth Marie Counihan to Ronald James Rabalais; and Katherine B. Petrucci to Frank E. Ruccia.

Second Lieutenant Robert Wohler graduated from the Associate Quartermaster Company Officer's Course at Ft. Lee, Va. Private Richard Green completed basic training at Fort Dix and was assigned to the First Guided Missile Group at Fort Bliss, Texas, as an instructor in electronics. Second Lieutenant David Gushee took a well-earned furlough in August before leaving for overseas. He was with the Chemical Corps down at Fort Bragg prior to his shipping overseas.

Barbara and Lee Powers now hear the patter of six little feet. Stephen Haskell Powers (their third child) was born to the couple on August 22. Robert Donohue is

working at M.I.T. in the Aeronautical Research Laboratory. Bob Snedeker, after getting his M.S. at Technology, was employed by Monsanto's Merrimac Division at Everett, Mass. Leroy White received his M.S. in chemical engineering at Columbia and is a member of the research department of Monsanto's Chemical Plastic Research Division at Springfield, Mass. Frank Calkins received his M.S. in chemical engineering from Northwestern University and he, too, joined Monsanto. He is at the Monsanto William G. Krummrich plant at Monsanto, Ill. Robert Gold was recently appointed to the faculty of Northeastern University, and he will instruct in the mathematics section. Stephen R. Arnold is now an employee of the Los Alamos Scientific Laboratory at the University of California.

I was startled, while reading this month's clippings, to read of the death of Sam Bidwell. I only have limited information, but Sam was employed by Spencer Kellogg and Sons of Des Moines as a chemical engineer and he passed away at the Memorial Hospital in Scarsdale, N.Y., on July 27. He is survived by his widow, Eleanor.

Nano Romaguera is still happily employed in Columbia, South America, but his Uncle Sam has given him a preinduction physical and he passed it with flying colors (the only test he ever managed to pass so easily) and, if Nano doesn't watch his step, he too will be a happy little basic trainee in the Army. I have a note received from Carl Mellin last Alumni Day that I forgot to enclose in last month's issue. It's directed to Andy Price, and Carl wants to know what has happened to that great publication, *Voo Doo*. "Same jokes as usual but none of that old gusto" Carl demands an investigation to see whether or not *The Tech* is sabotaging that great publication, *Voo Doo*.

Life at O.C.S. is never-changing. By the time most of you read this issue I will have received my bars and I will be on a 20-day leave visiting Boston and New York. Meet you at the Elliot Lounge in Boston, or at the Clock in the Biltmore in New York, if anyone is frequenting those towns at Christmas time. A very Merry Christmas and a sober New Year to all the members of the Class of '50. — JOHN T. WEAVER, *General Secretary*, 1772 East Tremont Avenue, New York 60, N.Y.

## • 1951 •

A word of explanation is in order for all '51 men who wondered about the class notes for November. Space limitation, due to circumstances beyond the control of the Review staff, made it necessary to omit all of the news about the guys and gals who tied the marital knot or announced their intentions. Also omitted was the news about the boys who are now working for Uncle Sam. In view of these facts, it is the hope of your Secretary that this issue will help answer some of your questions about what many of your former classmates are doing.

Among the many who are engaged are the following: Jim Batten to Anne Kelly; Bill Bruce to Jean Lemieux; Russ Casella to Marilyn Smith; Alan Fallor to Ruth Grant; Chuck Cordes to Virginia Woodman (Chuck reported to Wright-Patterson



Field at Dayton, Ohio, for active duty with the Air Force); Roger Downey to Marjorie Colpitts; Phil Gruber to Eleanor Burns; Henry Hahn to Marilyn Sholtz (Hank is doing graduate work at Rensselaer); Stan Jones to Jacquelin Dowling; Hu Knipmeyer to Mary Jane Goff; Bob Kress to Frances Conner; Ross McKinney to Margaret Curtis; Ed Renier to Joan White; Les Slocum to Eileen Churchill; Bill Ericson to Carol Ivison; Bernard Spring to Phyllis Tubiolo; and Bob Stephenson to Joanne Wentz. Some of these engagements have probably culminated in marriage, due to the time required for the news clippings to complete their journey. In any case, congratulations to you all.

With regard to the boys who said "I Do," the list is more extensive. The following marriages have taken place: Bill Benfer to Nancy Simmons in Dallas, Texas, on June 26; Rex Bradford to Barbara Know of Somerville, Mass.; Morton Bromfield to Eileen Dana of Dorchester, Mass.; Dick Chiacchia to Lorraine Neas on June 9 in Framingham, Mass.; Roger Compton to Eleanor Howell on July 1 in Milton, Mass.; Dick Davis to Sally Patten on May 30 in Boston; Joe DeClue to Marjorie Hennessey in Belmont, Mass., on June 9; Seymour Engel to Pauline Cohen in Boston on June 24; Mike Dubitzky to Norma Newburgh of Brookline, Mass.; Marv Frank to Anita Rossien; and Bill Freeman to Mary Ann Crowell in Westfield, N.J. Also, Jon Ganger to Jewel Ward on June 3 in Sudbury, Mass.; and Harold Glenzel to Lois Dickson on June 10 (Harold joined the Carroll Construction Company of New York as a building construction engineer).

As you can see, the boys of '51 have shown little hesitation before setting forth on the sea of matrimony. Some of the others who spliced the knot are: Julian Gross to Ednae Bligh at Roxbury, Mass., in a June wedding; Bill Krivsky to Ann Harlow on May 26 (Bill is at M.I.T. working for his doctor's degree); Loring Lee to Ellen Corey in South Boston; Fred McCauley to Priscilla Whittemore on June 9; Dick Mascalo to Ann Lewis in Boston on July 14; and George Meckert to Marion Wolff in Summit, N.J., on June 16. Next, Francis Packer to Barbara Kraft in Montclair, N.J., on July 21; Marc Pearlman to Eleanor Kelman on July 15 in Providence, R.I.; Fred Radcliffe to Jeanne Warner on June 2; Tom Rebarchak to Faye Vance; Bob Rullman to Rosanna Kirlin on June 10 in Back Bay; and John Sevier to Sylvia Thyng on June 10 in Cambridge. Also, Markwick Smith to Martia Reed in Boston, way back in March, 1951; Bill Stolecki to Eunice Randall in September; Mel Stone to Shirley Fleischer on June 23; Fred Vanderschmidt to Hannelore Falk on June 30 at Great Neck, N.Y.; Frank Tully to Dorothea Macadam in a June wedding at Beachmont; Dexter Whittinghill to Norma Horsford in July at Charlotte, Vt.; and Paul Rothery to Janice McGuire on July 7 in Middletown, N.Y. Bob Lindquist exchanged vows with Jane Perry in September at Rockland, Maine, and Ed Stringham joined Mary Anne Dresser in a lifetime partnership. To all you fellows and gals, your Secretary expresses congratula-

tions and hopes that from time to time you find a few moments to write of your activities. And now let's take a look at the news about the boys who formed a contract with Uncle Sam.

Wright-Patterson Field at Dayton, Ohio, was the objective of many of the boys who now are in the service. Among the fellows who reported there are the following: Fred Aldrich, Gene Babb, Frank Binns, Dick Foster, Dave Kallander, Allen Larsen, Fred Lehmann (Fred was sent to Dover, Delaware), Will St. Laurent, Dave Long, Roy Niemela (who is now assigned to the Inspector General's Staff), Gordon Oxx, and Dan Sully. Ralph Romano had a brief sojourn from duty by getting assigned to the Cambridge Research Staff for three weeks; he is now back at Wright-Patterson. Among the other boys in the Air Force are: Marc Pearlman, Bob Stephenson, Jon Ganger, Hal MacKay, Bob Knopf, Bob Gooch, Marty Miller, Lou Marcus, Herb Yamane who is now stationed at White Plains, N.M., and Frank Mayer. Bill Seiler reported for duty with the Army Engineers at Fort Belvoir, Va. John Richards is with the Air Force at New Mexico. The weather service of the Air Force now has the services of Ken Peterson; he is stationed at Tampa, Fla. Tom Kelly, when last reported, was waiting for a call to Officers Candidate School in the U.S. Naval Reserve. Austin Hubbard reported for duty at the Coast Guard Shipyard at Curtis Bay, Md., as did Parker Chapman. Bob Dow completed the eight-week leaders' course at Fort Jackson, S.C. And speaking about the service, your Secretary wishes to report that up until June 13 he thought these class notes would be written aboard a ship cruising off the Korean Coast. At that time the U.S. Navy canceled his recall orders so he hopes to continue writing the class notes from the Harvard Business School. Marv Grossman, Fred Weitz, Glenn Battaglia, Ed Richard, and John Lindholm are some of the other '51 men at the "B" School.

After spending four years at Technology, some of the fellows headed for the wide open spaces. Vince Frasca is working in Casablanca, French Morocco, together with Martin C. Murphy and H. James Kyros; all of them are working for the Porter-Urquhart Association, consulting engineers of Newark, N.J. Ernie Jensen is overseas doing vital work for Uncle Sam. And Chuck Johnson wants to see the world; he is working for the Isthmian Steamship Company. Pete Philliou decided to work for the Arabian American Oil Company in Manhattan. Mal Stuart is now on the West Coast working for Boeing at Seattle. Lou Sylvia joined the engineering staff of the Du Pont plant at Wilmington, Del. Tony Tabak is now at the General Electric plant at Lynn, while Fred Radcliffe is associated with the Bigelow-Sanford Rug Company. The Reynolds Metal Company of Louisville, Ky., now has the services of Walt Johnson. Russ Osborn is working as a safety industrial engineer for the Liberty Mutual Company. Hank Spaulding is living in New York City where he is doing civil engineering work with the firm of Parsons, Brinckerhoff, Hall, and MacDonald.

Some news is available concerning the co-eds: Anne Gillis, who received an M.S. in Chemistry, is working as a research chemist at the Naugatuck Chemical Company. Eleanor Semple spent some time doing product design work for the General Electric plant in Bridgeport, Conn.; she is now on temporary assignment in the G.E. office in Boston. Pris Maurer decided to join the D.I.C. staff at M.I.T.; and Marge Irby, who is now a Mrs., is working for a company in Devens. The company specializes in canning water for the Navy.

Charles A. Compton is now teaching physics and mathematics at the Mt. Hermon School in Northfield, Mass. Handford Cummings, Jr., joined the faculty staff of the Air Force Institute of Technology at Wright-Patterson. Jim Coakley is at M.I.T. working for his master's degree, after receiving a research fellowship from the Division of Industrial Cooperation. Jim McKenna is studying at the University of Edinburgh in Scotland after receiving a Fulbright Award. Bob Pelletier's bachelor of architecture thesis concerning a building plan is being used as a guide in the construction of the community house at Beverly, Mass. Hugh Campbell, who received his doctor's degree in organic chemistry, joined the research staff of the Du Pont Company's electrochemicals department at the Niagara Falls, N.Y., plant. And the research staff of the Du Pont's experimental station at Wilmington, Del., has the services of William Phillips; he received his doctor's degree in physical chemistry in September. Bill Bednar and Ken Holmes completed a six-week course conducted by the Johnson Service Company at Milwaukee; both men are now with the engineering staff at Milwaukee. Harry Zimmer is associated with the Shell Oil Company at Martinez, Calif.; his work as a technologist consists of process evaluation, design of operating units, and the economics and scheduling of refinery operations.

Some of the boys who decided to go after their master's degree at M.I.T. are: Lou Tedeschi, Mike Rivas, Joe Pagano, Denny Spangler, Pete Plender, Chuck MacDonald, and Bill Miller and Bob Pfaff, who are completing their fifth year in VI-A. A letter from Art Wasserman gives some information about the boys at the Chemical Engineering Practice School at Oak Ridge. Marv Baker, Ed Renier, Pete Lang, Doug McGrew, John Morgenthau, Tony Stathoplos, Karl Kniel, Alve Erickson, Clarence Gregory, Ken McCorkle, and Dick Reuther, together with Art, are combining theory and practice. Terry Butler is at the Harvard Graduate School of Engineering.

Though these notes are being written in October for the December issue, your Secretary, and on behalf of Art Wasserman, wants to wish each and every one of you a very Merry Christmas and a Happy New Year. Thanks are extended to those of you who have written to me about your work and a sincere invitation is extended to all to keep writing notes or letters so that the rest of your classmates can keep informed. — STANLEY J. MARCEWICZ, Secretary, Morris D-34, Harvard Business School, Soldiers Field, Boston 63, Mass.



*Research*

A spinning ring must be perfectly smooth to operate economically and efficiently. Draper "Mirror"\* spinning rings have been famous for 80 years for their smoothness and durability. These two qualities are guaranteed by continuous testing and research in the laboratory.

The electronic computer, or profilometer, measures the surface smoothness in micro-inches (RMS) and is accurate to a ten millionth of an inch. The piloter attachment shown above, was specifically designed recently to enable us to maintain correct surface smoothness.

\*Reg. U.S. Pat. Off. Draper automatic looms produce more cloth at less cost throughout the world.

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## RESISTANCE LIMIT BRIDGE

*Direct Reading in Percentage Deviation  
over Range of  $\pm 20\%$   
from 1 Ohm to 1,111,111 Ohms*

**SIMPLE TO USE**

**VERSATILE**

**ACCURATE**

*Reads directly  
in Percentage Deviation*

*Matches  
Pairs of Resistors*

*Compares Resistors  
to Standard Sample*

*Adaptable to Automatic  
Sorting and Inspecting*

The new G-R Resistance Limit Bridge uses a conventional equal-arm Wheatstone bridge circuit, supplied from a constant voltage d-c source.

The built-in resistance standard is composed of seven Type 510 Decade Resistors, adjustable from 1 ohm to 1,111,111 ohms in 0.1 ohm steps.

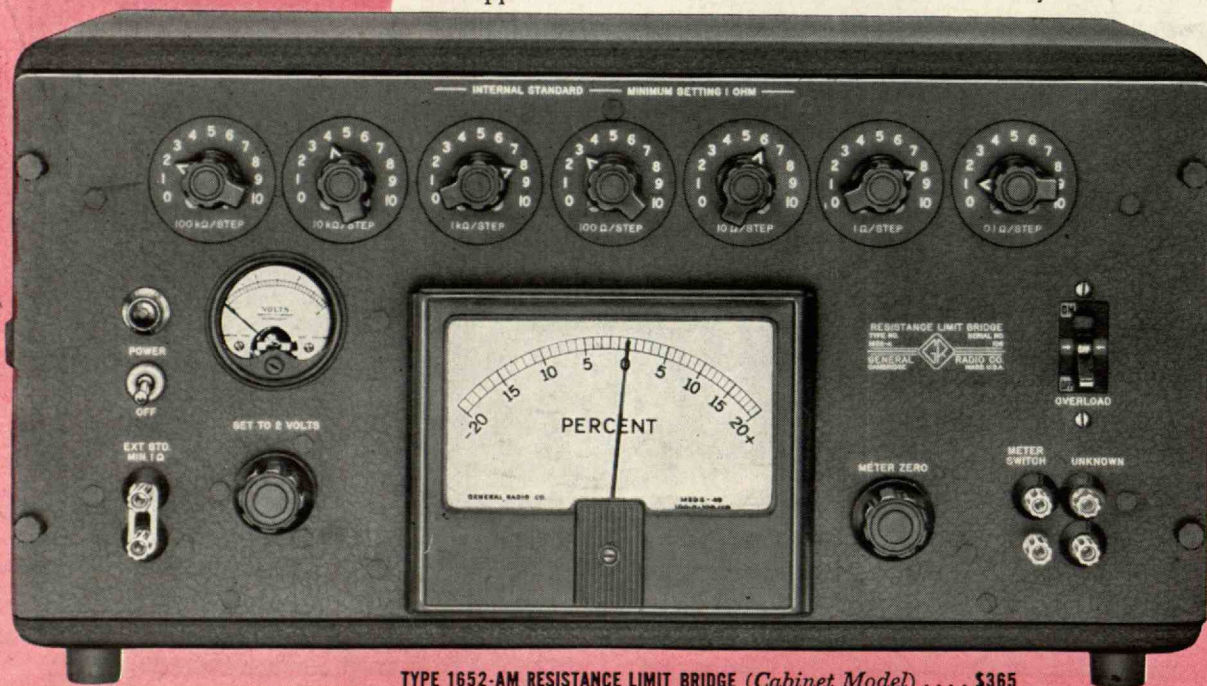
The indicating meter shows percentage difference between the unknown and the built-in standard over a range of  $\pm 20\%$  on a meter the scale of which is colored gold for 5% limits and silver for 10% limits as an aid to rapid operation.

A sensitive relay can be substituted for the indicating meter to operate various types of rejection or selection mechanisms for automatic sorting or inspecting.

The instrument can be used as a conventional Wheatstone bridge. Its accuracy is adequate for a large majority of resistance measurements. Its ability to measure resistances up to one megohm without added booster voltages increases its utility considerably.

As a limit bridge its accuracy is  $\pm 0.5\%$  or better; for matching pairs of resistors it is accurate to  $\pm 0.2\%$ ; for null measurements, with an external standard, between 1 ohm and 2 megohms the accuracy is  $\pm (0.2\% \text{ plus accuracy of the standard})$ .

The instrument is a-c operated from 105-125 or 205-250 volts, 60 cycles. It is supplied in either welded aluminum cabinet or relay-rack models.



TYPE 1652-AM RESISTANCE LIMIT BRIDGE (Cabinet Model) . . . \$365

TYPE 1652-AR RESISTANCE LIMIT BRIDGE (Relay Rack Model) . . 365

STROBOSCOPES • VARIACS • SOUND-LEVEL METERS

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